OHIO STATE

Gleanings in Bee Culture

Bees, with prophetic instinct of want,
had hoarded their honey
Till the hives overflowed; and the
Indian hunters asserted
Cold would the winter be, for thick
was the fur of the foxes.
—Longfellow.

Vol. LI. November, 1923 No. 11

Better Way to Garden

Don't do garden work the slow back-breaking way. You can grow a far better garden, easier and with much less time and work.

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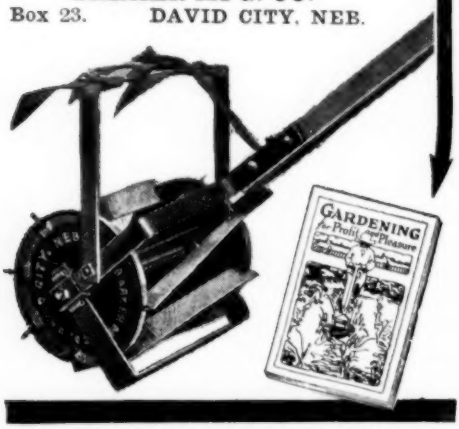

Barker Mfg. Co., Box 23, David City, Neb.

Gentlemen: Send me postpaid your free booklet and Factory-to-User offer.

Name .....

Town .....

State..... RFD or Box.....

New York State Beekeepers!

Write us for quotations on your next season's requirements for

ROOT QUALITY BEEKEEPERS' SUPPLIES.

We still have a good supply of friction-top pails, glass jars, and five-gallon square cans, and can ship promptly. Prices are as follows:

60 2½-lb. cans, $2.70; 5-lb. pails, 50, $3.65; 100, $7.15; 200, $14.00. 10-lb. pails, 50, $5.50; 100, $10.50. 60-lb. cans, two in box, $1.20 per box; 50 boxes, $57; 100 boxes, $110. 16-oz. round jars, 2 doz. en to case, $1.35. 32-oz. round jars, 1 doz. to case, $1.00. All f. o. b. Syracuse, N. Y. To insure **prompt service** send all orders for goods listed in **Root's Catalogs to Syracuse.**

Root 2½-lb. lithographed pails, 50-500 per 100, $6.25; 500 up, per 100...$5.95

Root 5-lb. lithographed pails, 50-500 per 100, $10.75; 500 up, per 100..10.25

F. O. B. factory West Virginia. Your name and address stenciled free on lots of 100 or more.

A. I. Root Co. of Syracuse, N. Y.

1631 W. Genesee St.

Serves You Best

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Editorial Staff

Geo. S. Demuth and E. R. Root, Editors — H. H. Root, Assistant Editor — H. G. Rowe, M'n'g Editor

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Root's Goods at factory prices with WEBER'S service. Send us a list of your wants and we will quote you prices that will save you money.

C. H. W. Weber & Co.

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We are now booking orders for 1924 delivery. After several years' experience in shipping different sizes of nuclei and pound packages to nearly all parts of U. S. and Canada we have found the regular three-frame size with one extra pound of bees to be the correct size to insure the purchaser a surplus crop of honey, provided the bees are received before May 15.

Over 1000 colonies will be operated for the sale of nuclei. Booking capacity 2000 nuclei. We beg to advise purchasers to order early as we were unable to supply the demand of 1923. For those who have become disappointed in results obtained from buying bees in package form, I would like to urge the purchase of some of our large three-frame nuclei with the extra pound of bees. Safe arrival and satisfaction guaranteed. Bees are absolutely free from all contagious diseases. Bees will be shipped on combs built from full sheets of foundation nearly all brood capped. Send for circular telling more about our nuclei. Terms, 20 per cent with order, to guarantee acceptance. Balance before shipment.

3-FRAME NUCLEI OF ITALIAN BEES WITH QUEEN.....$5.00 EACH
25 LOTS OR MORE..... 4.75 EACH

Ask for prices on 100 lots or more.

"The bees arrived yesterday and they were the finest lot of bees I ever looked at. Not one comb broken.—Dr. Chas. S. Chadwick, Jackson, Mich."

"Bees to hand in fine order. I am well pleased with the 50 nuclei.—Robt. Hunter, St. Etienne De Beaucharnois, Quebec, Canada."

"I am much pleased with your stock and have recommended your bees to a number of beekeepers.—Otto W. Gall, Inspector of Apiaries, Binghamton, N. Y."

"Some of the nuclei you sent me have made 80 pounds surplus already.—Maurice Geary, Ironwood, Mich."

"The bees I received June 1st have made me nearly one super of surplus. The above speaks well for the extra bees.—Omar C. Curtis, Escanaba Nat'l Bank, Escanaba, Mich."

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A Merry Christmas for that Boy of Yours!

Your boy's Christmas will be the happiest ever, if you will send him THE BOYS' MAGAZINE. **It is a gift that lasts a whole year.** This splendid magazine is chock-full of just the kind of reading **you** want **your** boy to have. Clean, inspiring stories by the world's best writers. **Practical** and **instructive** departments devoted to Radio, Mechanics, Electricity, Athletics, Physical Training, Stamp Collecting, Cartooning, etc., etc. Beautiful big pages with handsome covers in colors. A big lot of jokes and comic drawings.

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Name .....
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Your name .....

Italian Bees

2000 Colonies

If your community buys as many as 300 nuclei or packages, let us quote you on a carload of full colonies. We believe you will find they are cheaper than packages. Can supply you equipment for these also.

Cypress Bee Supplies

Standard ten-frame hive bodies, per 100, 70c each. White Pine Hoffman frames per 1,000, $45.00.

Let us quote you on your entire requirements.

The Stover Apiaries
Mayhew, Miss.

Honey Containers

5-lb. friction top pails, per reshipping case of 12 ..... $1.10
10-lb. friction top pails, per reshipping case of 6 ..... .90
5-lb. friction top pails, per crate of 100 ..... 7.00
5-lb. friction top pails, per crate of 200 ..... 13.50
10-lb. friction top pails, per crate of 100 ..... 10.00
60-lb. square honey cans, per case of 2 cans 1.25
60-lb. square honey cans, per case of 1 can ..... .80
60-lb. square honey cans, in bulk, each ..... .40
16-oz. round glass jars, per reshipping case of 24 ..... 1.35
6½-oz. tin top tumblers, per reshipping case of 48 ..... 1.60

Write for prices on shipping cases. Our cases are neat, smooth and strong, made from white winter-sawed basswood.

SECTIONS!

No. 2 4¼x4¼x1⅞ two-beeway, per 1000 ..... $9.50

We have an oversupply of these sections, and are offering them at this reduced price for a limited time only. We carry a full line of Bee Supplies; write for our free descriptive catalog and price list.

AUGUST LOTZ CO., Boyd, Wis.

XUM

HONEY MARKETS

Information from Producing Areas (first half of October).

California Points: Southern California.—Bees are going into winter very short in stores; also, many are short in brood and will be slow in breeding up in the spring even if they come through the winter. Supplies very light, most beekeepers securing no surplus. No sales reported. Central California—Honey in Inyo County mostly out of beekeepers' hands. Bees are in good shape, with some fall nectar still coming in. Little honey available along the Coast, but one car white orange reported sold at 11½c per lb. Northern California.—Recent rains have stopped thistle flow for the season, which has been below normal. Bees now working on walnut honeydew, which is black and will spoil any light honey still on the hives. Several apiaries and considerable honey burnt during recent fires. Bees are said to be in excellent condition, and if the warm weather continues throughout October colonies will go into winter quarters with brood-nests well filled. Eucalyptus very heavy in bud. A few beekeepers have been storing their honey in public warehouses and using the warehouse certificate as collateral on which to borrow from the banks. Few sales white star thistle reported low as 8c per lb., but most sales made at 10c. Several carlots reported sold at this price, and one at 10½c per lb. Some single 60-lb. cans bringing 12-13c per lb. and 10-lb. pails 15-16c per lb. Beeswax selling at 24c per lb. cash or 26c per lb. in trade.

PACIFIC NORTHWEST.—Bees in unusually good condition. Demand good, and honey is moving readily. Some distress lots extracted are selling at 10-11c per lb. in 60-lb. cans; others are selling at 12½-14c, with small pails moving at 12-18c per lb. One carlot white extracted reported sold at 10c per lb., while some are holding for 12c per lb. in carlots.

INTERMOUNTAIN REGION.—Colonies generally have ample stores, especially in Colorado and Utah areas where nectar flow continued until early October. Honey plants are in extra-good shape. Colonies are being packed for winter, although rain is hindering in some sections. Demand good and improving, and honey is moving out rapidly. Inquiry from carlot buyers increasing. The supply of comb honey is very short, and in many districts is entirely exhausted, with numerous carlot orders refused for lack of stock to fill them. There is still considerable extracted honey available. Prices show a wide range. Many carlots of white sweet clover and alfalfa extracted have been sold at 8c, 8¼c, 8½c, 9c, 9¼c and 10c per lb, with some beekeepers accepting as low as 7c per lb. from nearby buyers. Single 60-lb. cans are selling up to 12½c per lb. White comb honey shows an even wider range. In carlot sales the best stock has sold all the way from $3.50 to $5.00, with sales at $3.50, $3.75, $3.90, $4.00, $4.25, $4.40, $4.50 and $5.00 per case. Beeswax quoted at 23-30c per lb., mostly 23-25c.

ARIZONA POINTS.—Weather favorable and colonies raising some brood. Most honey already disposed of. One carlot 1923 crop reported sold at 7¼c per lb., and one at 8¼c, with ton lot sales of 1922 crop honey reported at 7½-8c per lb.

TEXAS POINTS.—As a result of abundant fall rains, sufficient nectar flow has been secured so bees are brooding up nicely, and many colonies will store more than sufficient for winter stores. Demand good for chunk honey and moderate for extracted, but in many sections beekeepers will not have enough honey to supply local orders. Few sales reported of light extracted at 12½-16c per lb., and of chunk at 16-17c per lb.

PLAINS AREA.—Honey plants are in good condition for next year, as a result of frequent rains, and bees are generally in good condition. Some colonies, however, did not secure a pound of surplus and must be fed. Market strengthening. Carlots of white extracted quoted at 10c per lb., ton lots at 10-11c, single 60-lb. cans at around 12½c, and small pails at 12½-13c.

EAST AND NORTH CENTRAL STATES.—Over a considerable area bees stopped breeding unusually early, as a result of cold, rainy weather, thus lessening chances for good wintering. Many colonies, especially in Ohio and Wisconsin, must be fed. The rains have placed honey plants in most sections in good shape for next year. Honey is moving well. Prices show a wide range. Carlot and ton-lot sales of white clover extracted reported at 9½-12c, with single 60-lb. cans moving at 10-15c, mostly 12½-15c, and small pails at 13-22c, mostly 14-18c per lb. Dark extracted quoted at 8-9c per lb. in 60-lb. cans or 11-13c in small pails. No. 1 white comb sold all the way from $4.25-6.00 per case, mostly around $5.00-5.50.

SOUTHEASTERN STATES.—Ample stores assured in most sections except the black belt of Alabama. Mexican clover and other fall flowers are producing nectar in Georgia, and wild sunflowers are yielding in Florida. Fine flow from Spanish needle secured in Mississippi. Where requeening is not properly done, some equalizing for winter and some spring feeding may be necessary. Demand for chunk honey exceeds supply; fairly good demand for extracted. It is thought that comb-honey production will increase next season. Few sales reported of light amber extracted at 8-10c per lb., and of amber at 6-8c. Small pails light amber are selling at 14-18c per lb. Some sales of beeswax at 23c per lb. reported.

NORTHEASTERN STATES. — Frost has definitely ended fall flow (which in many areas was unusually light because of preceding cold weather), and bees are being packed for winter. As a result of cold weather bees stopped breeding early, but otherwise are in good condition. Condition of honey plants appears to be spotted. The lessened fall flow will necessitate considerable feeding. Shortage in comb supply has increased the demand for comb honey, and many beekeepers have sold their entire production. Extracted is not in such good demand as comb, but considerable has been sold. White extracted has been selling around 10c per lb. in carlots, 9-12c per lb. in ton lots, 12½-15c in single 60-lb. cans, and 12-20c, mostly 15-18c per lb., in small pails. A carlot sale of buckwheat reported at 9c per lb., ton lots at 9-10c, single 60-lb. cans at 11-12½c, and small pails at 12-18c per lb. Three carlots comb reported sold at a flat price of $4.00 per case for all grades, smaller lots white clover comb have sold at $4.50-5.25 per case. Buckwheat comb quoted at $4.00-5.00 per case. Beeswax bringing the beekeeper 27-35c per lb., according to color.

PORTO RICO.—Nectar flow is still on in the hill sections. Fair showers reported over the entire island. Prices unchanged. Amber extracted quoted at 5¾c per lb. to the beekeeper.

H. C. TAYLOR,
Chief of Bureau of Markets.

The A. I. Root Company's Report.

Since our last report we have bought two carloads of white and water-white extracted western sweet clover honey at 8c and 8½c, several small lots of best-quality extracted white clover from local points at 9½c, and one special lot at 10c. We also received a small quantity of Porto Rican extracted honey for baking purposes, put up in barrels, at 6¾c per pound f. o. b. New York. All of the above prices were f. o. b. shipping point.

From Producers' Associations.

The condition of the bees in Texas has not been better since the fall of 1916. Recent rains have caused slight honey flows all over the state. Bees have reared brood, and colonies are in better than normal condition to go into winter. From practically every

district in the state beekeepers are reporting brood-rearing, and in a few places small swarming has been experienced. Market conditions are good. Stocks are practically cleaned up. Prices are ruling higher. Extracted honey brings about 12c per pound, wholesale quantities, f. o. b. producing point. No comb honey is being offered.

Texas Honey Producers' Assn.,
San Antonio, Tex. E. G. LeStourgeon, Mgr.

The Opinions of Honey Producers.

Early in October we sent to actual honey producers the following questions:

1. What per cent of the honey produced in your locality has already left the hands of the producers?
2. How does the number of colonies that will go into winter quarters compare with that of last year? Give answer in per cent.
3. What is the condition of the colonies compared with normal as to (a) number and age of bees? (b) stores for winter? Give answer in per cent.
4. What is the condition of the honey plants for next season as compared with normal? Give answer in per cent.
5. What prices are producers being offered for the new crop at their stations in large lots (carload or entire crop)? (a) Extracted honey? (b) Comb honey?
6. What are prices when sold to grocers in case lots? (a) Extracted honey in 5-lb. pails or other retail packages in terms of 5-lb. pails? (b) Comb honey, fancy and No. 1, per case?
7. What is the retail price to consumers in your locality? (a) Extracted honey in 5-lb. pails or other retail packages in terms of the 5-lb. pail? (b) Comb honey per section?

The answers, as returned by our bee and honey reporters, are as follows:

State.	Reported by:	Pct. Sold.	No. Col.	Col. No.	Cond. Stores.	Plant Con.	In large lots. Ext.	In large lots. Comb.	In small lots. Ext.	In small lots. Comb.	Retail prices. Ext.	Retail prices. Comb.
Ala.	J. M. Cutts	..	95..	80..	50..	100	..	..	..	..	..	..
Ala.	J. C. Dickman	75..	100..	100..	100..	80..	$.08..	..	$.75..	$4.00..	$1.00..	$.20
Ark.	J. V. Ormond	100..	100..	75..	75..	100	..	..	..	..	1.25..	..
Cal.	L. L. Andrews	100..	75..	60..	50..	50	..	..	..	..	1.25..	.25
Cal.	M. C. Richter	80..	120..	110..	130..	..	..	..	..	..	1.50..	..
Cal.	M. A. Saylor	50..	100..	100..	100..	100	.08½	3.60	.70..	4.00..	.90..	.25
Cal.	G. Larinan	50..	80..	..	..	..	.12..	..	..	..	1.00..	..
Cal.	M. H. Mendleson	..	100..	75..	75..	..	..	..	..	..	..	..
Col.	J. A. Green	60..	100..	100..	100..	100	.08¾	4.25	.70..	3.75..	.85..	.20
Col.	B. W. Hopper	90..	100..	100..	100..	110	.10..	4.75	.75..	5.00..	.85..	.25
Conn.	A. Latham	15..	105..	100..	85..	100	..	..	1.00..	6.50..	1.25..	.35
Conn.	A. W. Yates	10..	75..	100..	100..	75	.11½	5.25	1.00..	7.00..	1.30..	.40
Fla.	C. C. Cook	60..	120..	120..	120..	100	.07..	..	.75..	..	.95..	..
Fla.	H. Hewitt	80..	110..	100..	100..	100	..	..	.75..	..	1.00..	..
Fla.	F. E. Munson	80..	100..	100..	110..	100	..	..	.70..	..	.90..	..
Ga.	J. J. Wilder	90..	115..	100..	100..	100	..	..	..	..	..	..
Ida.	J. E. Miller	100..	11..	10..	10..	..	.08½	4.25	.52..	4.75..	.82..	.24
Ill.	C. F. Bender	10..	90..	100..	100..	75	..	..	..	5.25..	..	.30
Ind.	E. S. Miller	15..	85..	100..	100..	100	..	..	.80..	5.75..	1.00..	.30
Ind.	T. C. Johnson	50..	100..	100..	75..	100	..	..	.95..	5.25..	1.10..	.27
Ind.	J. Smith	..	100..	100..	75..	150	..	..	..	..	1.25..	.35
Ia.	F. Coverdale	100..	90..	95..	40..	80	..	..	..	..	..	..
Ia.	E. G. Brown	50..	100..	110..	100..	125	.08½	..	.75..	..	1.25..	..
Ia.	W. S. Pangburn	..	100..	100..	..	100	..	..	.75..	..	.80..	..
Kan.	J. A. Nininger	15..	100..	100	100..	100	..	..	.75..	5.75..	.95..	.30
Kan.	C. D. Mize	10..	80..	110..	120..	100	..	..	.80..	6.00..	1.00..	.32
Me.	O. B. Griffin	20..	97..	100..	100..	90	..	..	1.00..	6.75..	1.35..	.32
Md.	S. G. Crocker, Jr.	35..	100..	100..	90..	90	..	..	1.00..	5.00..	1.35..	.32
Mass.	B. N. Gates	55..	100..	100..	70..	..	..	..	..	..	..	.45
Mich.	I. D. Bartlett	25..	75..	75..	80..	100	..	..	.90..	4.50..	1.00..	.30
Mich.	B. F. Kindig	50..	95..	90..	90..	100	..	..	.90..	5.50..	1.10..	.30
Mich.	F. Markham	10..	90..	100..	100..	125	..	..	.80..	5.50..	1.25..	.30
Mich.	E. D. Townsend	40..	100..	100..	100..	100	.12..	..	..	..	..	..
Miss.	W. E. Elam	75..	50..	50..	100..	100	.10..	..	.75..	..	1.00..	..
Miss.	N. E. Jensen	10..	90..	95..	100..	95	.12½	4.50	.85..	5.00..	1.00..	.25
Mo.	J. H. Fisbeck	2..	100..	100..	100..	100	..	..	..	..	1.25..	..
Mo.	J. W. Romberger	10..	100..	100..	100..	100	.08¾	4.00	.50..	5.00..	.85..	.30
Neb.	J. H. Wagner	20..	100..	100..	100..	105	.10..	4.50	.87..	6.50..	1.10..	.35
Nev.	T. V. Damon	..	80..	90..	90..	100	.07⅝	4.00	..	..	..	..
N.J.	E. G. Carr	..	90..	100..	100..	80	..	..	..	..	1.25..	.35
N.Y.	Adams & Myers	10..	80..	100..	100..	100	.10¾	..	1.00..	6.00..	1.30..	.35
N.Y.	F. W. Lesser	50..	120..	90..	90..	100	.10½	4.80	..	..	..	..
N.Y.	G. B. Howe	50..	100..	100..	75..	75	.12..	5.25	1.00..	5.50..	..	.30
N.Y.	R. B. Willson	30..	80..	90..	85..	80	.11¾	5.15	.80..	5.50..	1.00..	.27
N.C.	C. L. Sams	50..	105..	100..	100..	100	.11..	4.00	1.00..	5.50..	1.50..	.30
Ohio.	F. Leininger	75..	70..	80..	25..	70	.10..	..	1.25..	..	..	..
Ohio.	J. F. Moore	50..	90..	100..	70..	90	..	..	.85..	4.80..	1.10..	.30
Okla.	J. Heueisen	..	90..	70..	50..	100	..	..	..	..	..	..
Okla.	C. F. Stiles	..	90..	90..	80..	80	..	..	.85..	6.00..	1.15..	.30
Ore.	H. A. Scullen	20..	100..	90..	80..	100	..	..	.90..	5.25..	1.10..	.32
Ore.	E. J. Ladd	20..	100..	100..	80..	100	..	..	..	5.75..	..	.30
Pa.	H. Beaver	60..	65..	90..	100..	80	.11½	..	.70..	..	.85..	..
Pa.	D. C. Gilham	15..	70..	90..	85..	95	..	..	1.20..	8.00..	1.50..	.47
S.C.	A. S. Conradi	100..	100..	90..	90..	100	..	..	1.00..	8.40..	1.25..	.35
S.D.	L. A. Syverud	35..	100..	100..	90..	110	..	..	..	..	..	..
Tenn.	J. M. Buchanan	75..	95..	100..	90..	100	..	..	1.00..	..	1.25..	.35
Tex.	T. A. Bowden	75..	105..	100..	100..	..	..	..	.85..	..	1.15..	..
Tex.	J. N. Mayes	100..	80..	90..	100..	75	..	..	.62..	..	..	..
Vt.	J. E. Crane	33..	105..	100..	100..	100	..	..	..	5.25..	1.25..	27
Va.	T. C. Asher	75..	100..	100..	110..	100	.15..	..	1.10..	6.00..	1.25..	.30
Wash.	N. E. France	15..	100..	100..	70..	100	..	..	1.00..	4.50..	1.25..	.27
Wash.	W. L. Cox	25..	100..	90..	95..	85	.11..	..	.80..	5.00..	1.00..	.30
Wash.	G. W. B. Saxton	15..	100..	100..	100..	100	.11..	..	.75..	..	.90..	..
Wis.	E. Hassinger, Jr.	30..	100..	100..	100..	90	.11..	..	.80..	..	1.00..	..
Wis.	H. F. Wilson	20..	98..	100..	100..	100	.10..	5.25	..	6.25..	1.10..	.32
Wyo.	C. H. Ranney	60..	120..	100..	125..	..	.08½	..	.60..	..	.75..	..

XUM

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Combs after treatment are as good as they were before infected. Write for information, which will be sent on request.

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Canadian Distributor, Dr. C. J. Devins, Aurora, Ontario.

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10-frame Standard Hives, metal cover, inner cover, frames complete, per crate of 5	$13.00
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Jumbo Hive Bodies with frames, per crate of 5	6.50
10-frame Shallow Extracting Supers, per crate of 5	4.00
10-frame No. 1 Comb Supers, per crate of 5	4.00
10-frame No. 3 Comb Supers, per crate of 5	6.00
Standard Hoffman Frames, per 100	5.00
4¼x4¼x1⅞ A Grade Sections, per 500	6.00
4¼x4¼x1⅞ B Grade Sections, per 500	5.00
4x5x1⅜ A Grade Sections, per 500	5.50
Medium Brood Foundation, per pound	.50
Thin Super Foundation, per pound	.60

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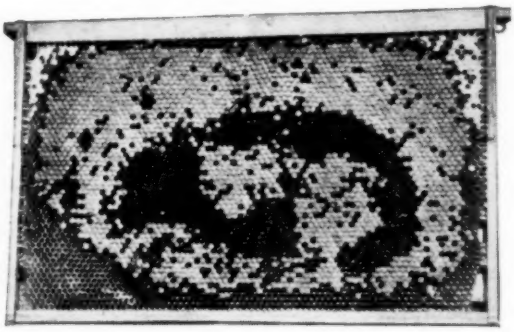

A large comb of brood from Wired Foundation.
Notice the brood clear to the top-bar.

Dadant's Wired Foundation Gives the Greatest Possible Results in Good Combs

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DADANT & SONS
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Gleanings in Bee Culture

NOVEMBER, 1923

EDITORIAL

Isle of Wight Disease.

THE United States Department of Agriculture is issuing a bulletin entitled "The Occurrence of Diseases of Adult Bees, II.," as Department Circular 287, by Dr. E. F. Phillips. This is a comprehensive review of what is known concerning the Isle of Wight disease, the countries in which it has been found, and the steps that have thus far been taken to prevent its spread into other countries. The bulletin discusses the occurrence of the disease in Great Britain, France, Switzerland and Germany. The wide distribution of the Isle of Wight disease in Europe, and especially that in France and Switzerland on the Italian border, would indicate that the action of the United States and Canadian governments in excluding bees from other countries except under government regulations was taken just in time to prevent the introduction of this disease into these countries. In order to import queen bees into the United States from any country except Canada, it is first necessary to obtain permission from the Department of Agriculture; then, when the queens arrive, they are sent direct to the Department for examination for the mites causing the Isle of Wight disease, before being delivered to the purchaser.

Proposed Federal Disease Law.

THE September-October issue of "The League Bulletin" contains two items of especial interest. First, the annual convention of the American Honey Producers' League is announced for January 24 and 25, 1924, at the Great Northern Hotel in Chicago. Second, the Commitee on Legislation of the American Honey Producers' League has drafted a proposed bill to be presented to Congress to regulate the interstate transportation of honeybees and used apiary equipment, for the purpose of preventing and retarding the dissemination of brood diseases. The proposed bill, as now drafted, is printed in full in "The League Bulletin." It provides for prohibiting the transportation of bees or used supplies from one state to another without an inspection certificate from the proper state official, and authorizes the Secretary of Agriculture to arrange for inspection by federal men when necessary in those states which have no inspection service. The administration of the regulations would be in the hands of a board of three members, appointed from existing bureaus and officers of the Department of Agriculture, who shall serve without additional compensation.

Honey in Automobile Radiators.

SINCE the use of honey in automobile radiators was first published in the March, 1922, issue of Gleanings in Bee Culture, it has been tried out in all parts of the country where freezing occurs. If certain precautions are observed, honey mixed with water makes one of the best and cheapest anti-freezing mixtures known. In using honey for this purpose all connections must be tight, for the well-known tendency of honey to creep through an ill-fitting seal makes it necessary to take extra precautions in having tight connections. Also in filling the radiator, it should not be filled entirely full but room should be left for expansion, to prevent an overflow when the liquid is heated.

Only well-ripened honey should be used, for unripe honey is not so efficient in preventing freezing as well-ripened honey. Dark honey may do as well as light honey; but honeydew should be avoided, since the freezing point is not depressed so much when honeydew is used as when pure honey is used. Sugar syrup or molasses should never be used for this purpose, since it depresses the freezing point only about half as much as does honey of the same concentration. For ordinary winter temperatures, honey and water in equal parts well mixed will prevent freezing; but for extremely cold climates more honey may be necessary. Since honey does not evaporate as does alcohol, it is only necessary to add water as needed during the winter.

XUM

THE month of October has furnished its usual supply of fine weather for packing outdoor-wintered colonies and for feeding where feeding was necessary. In case this important work is not already finished it should be rushed to completion as quickly as possible, for such work becomes more and more difficult in November.

Protecting Outdoor Wintered Colonies.

There is one phase of protection that can be well taken care of in November if it has not already been done—that is, the providing of protection against the wind. Where the apiary is not already protected from prevailing winds, this can be done by a portable fence as illustrated elsewhere in this issue. If it is not convenient to build a windbreak of this kind, the apiary can be protected by storing corn fodder along the fence on the north and west sides of the apiary.

THE successful wintering of bees in cellars depends more upon the time and the manner in which they are put into their winter quarters than is usually realized. Colonies that are put into the cellar late in November or December without having had a good cleansing flight cannot be expected to winter as well as colonies put in even a month earlier but immediately after a good cleansing flight. A few weeks longer in the cellar apparently makes little difference, provided the bees are in proper condition when they are put in and have good stores to use while they are confined.

Putting Bees Into the Cellar.

No doubt most of the bees that are wintered in cellars will be put into their winter quarters before Thanksgiving. Occasionally the bees are put away as late as the first of December, but often when put in this late they winter poorly. In putting the bees into the cellar, the rule laid down by the old masters is to put the bees into the cellar the next day after they have had their last good cleansing flight in November. The rule is a good one, but the difficulty lies in determining just when this last flight day will occur.

In order that the bees shall be induced to fly freely when the day is suitable for a flight, they must first be compelled to endure a week or two of confinement. After they have been confined to their hive for such a period, as usually happens early in this month, they are quite anxious for a flight when a favorable day comes. When the proper kind of flight day comes so that practically every worker bee goes forth at some time during the day, the bees may all be put into the cellar as soon as it turns colder, even though the flight day comes during the first half of the month. After the bees have had a good cleansing flight, there is a strong temptation to leave them out for another flight which may or may not come. It is better to err on the safe side and put them in early rather than too late, for after they have had a good flight and have been put into the cellar in splendid condition they are probably better off than if left out to waste their energy in an additional flight that is not needed. Bees should usually be placed in the cellar about the 20th of November in the southern limits of cellar-wintering and earlier further north. Those who winter in cellars will be interested in the two articles on this subject in this issue by men who have had large experience in cellaring bees.

Those who winter their bees in the cellar should learn to interpret the weather maps put out by the Weather Bureau in order to be able to foretell the coming of a good flight day and the colder weather following. In New York State, Professor Willson of the Extension Service in Beekeeping, by co-operating with the Weather Bureau, has arranged to notify beekeepers, through key men located throughout the state, when the bees should be put into the cellar. Also in the spring, beekeepers are again notified in advance as to when the weather is expected to be suitable for taking them out.

BEEKEEPERS of central New Jersey, who have depended upon alsike clover and white clover for their main source of nectar, are very much concerned about the failure of the honey crop during the last few years in that locality. They point out that there is as much alsike clover as ever, but that it has failed to yield nectar in paying quantities for several years. They also point out that alsike clover was a dependable honey plant in this region until recently when the failures of their honey crops began. They are beginning to wonder if they are to have no more good honey flows from alsike clover. The information was gathered by the Editor in a trip through this section recently.

When Alsike Clover Fails to Yield.

Another bit of information picked up on the same trip was to the effect that farmers in this section have been economizing during the past few years by omitting the liming of the soil as was

formerly their practice. Apparently the thing most needed for the beekeepers of that region is more prosperity for the farmer, so that he can again afford to lime the soil. The most dependable localities for white clover and alsike clover are those having sufficient lime naturally in the soil for the greatest prosperity of these clovers.

Many Colonies Short of Stores.

WHILE in much of the country the bees are well supplied with winter stores, there are also many colonies in some of the best honey-producing regions not sufficiently supplied. In some regions where there was no fall honey flow, the bees have reared more brood than usual during the fall and thus used up much of their honey. This results in colonies in splendid condition for winter so far as their strength in young bees is concerned; but, unless much feeding is done, thousands of these splendid colonies will starve during the winter. This is especially true in portions of the clover region.

Where the season has been poor many beekeepers are inclined to neglect feeding needy colonies, hoping that they will pull through the winter without additional food. It can not be urged too strongly that beekeepers everywhere take special pains to have their colonies well supplied with stores. November is not too late to feed, especially if the bees are packed as they should be at this time. By using the ten-pound friction top pail as a feeder the bees can be fed even during cool weather by inverting the feeder directly over the cluster of bees, and then replacing the packing around the feeder to keep the colony warm.

Beekeeping cannot become the stable business which it should be until beekeepers quit taking such long chances on losing colonies from starvation or near starvation. A few dollars put into food for the bees at this time may return many times the amount invested next season, and no one who expects to continue beekeeping can afford to economize on winter stores.

It is almost proverbial among beekeepers that the best seasons usually come when the beekeeper is least prepared to take advantage of them. This is usually a result of neglect in giving the bees proper attention during a poor season preceding the good one by supplying sufficient stores. As beekeepers often express it, the best seasons usually follow the poorest ones.

With the market price of honey creeping upward slowly but surely, together with the much better movement on the market this season, the outlook for the industry is so much brighter that it would seem no one would neglect feeding needy colonies at this time. In addition to the better market conditions, the abundance of rain in most parts of the country during the summer and fall has put the honey plants in prime condition for next season. As that splendid veteran honey producer, J. E. Crane, said last month, "Never give up" should be the motto of the beekeeper.

County Associations to Fight American Foul Brood.

AS the season for winter meetings of beekeepers approaches, the value of organizing county associations for the purpose of fighting American foul brood should be considered by beekeepers wherever disease is present or imminent. If every county would form a local organization for this purpose, it would not be long until this scourge would be practically eliminated. In such a local organization every member would become a detective for ferreting out disease in his own neighborhood and especially in his own apiary. Whenever disease is found it could be reported to the association so that every member would know where it exists and be on his guard. In such cases the bee inspector would not be needed except in case of some one who refuses to clean up his own apiary.

In spite of all that has been said and written about the brood diseases and in spite of the work of the inspectors, they are still spreading and working havoc in many localities. In some cases good-sized areas have been cleaned up by the inspection service, but it would require many years to clean up any considerable part of a state with the funds usually available for this work. Local beekeepers' associations, working in co-operation with the state inspector, should be able to accomplish much in the eradication of disease, and it is to be hoped that such a movement will go forward in many states during the coming winter.

Such local associations would in no way interfere with the work of the state association. In many states the county associations have affiliated with the state association, thus giving the state organization a large membership, which in turn greatly increases its usefulness. Gleanings would like to see an organized fight against the brood diseases within the next few years on a scale never before attempted. Now is the time to start such a fight.

XUM

AMERICAN FOUL BROOD OUSTED

6000 Diseased Combs Saved by One Beekeeper this Season

By Geo. S. Demuth

ANOTHER long-cherished dream of beekeepers has come true! Combs containing American foul brood no longer need go to the melting pot! Even the worst of diseased combs can now be sterilized for a few cents each, thus rendering them as good as new. This discovery marks another great achievement in the development of beekeeping and ushers in a new epoch in disease control, which means an enormous annual saving over the present awful waste of combs infected with American foul brood. Not only will there be this great saving of valuable comb, but the advent of a practical method of sterilizing diseased combs will stimulate greater effort in the fight against American foul brood, which should result in greatly reducing the number of diseased colonies within the next decade.

When Dr. J. C. Hutzelman came to Medina more than a year ago to explain the action of a solution made of alcohol and formalin for disinfecting combs, he brought sufficient evidence to convince us that he had made an important discovery, but his article on the subject was withheld until the December, 1922, issue in order that tests could be made here before publication. These tests showed that combs filled with American foul brood scales were rendered sterile after being immersed in the alcohol-formalin solution for 48 hours, and could safely be given back to the bees. The announcement of the discovery was accordingly released in the December, 1922, issue of this journal.

However, the fact that combs could be sterilized in this way in the laboratory was by no means convincing that this method would be practical in the treatment of American foul brood. For this reason it seemed best to wait until the new treatment could be tried out in a practical way before recommending it in Gleanings for cleaning up American foul brood.

Wholesale Treatment of Diseased Colonies.

Fortunately for beekeepers an energetic business man and progressive beekeeper of Ashtabula, Ohio, O. E. Barber, decided last winter to increase his bee business by purchasing a group of apiaries containing over 500 colonies of bees, some of which he knew at the time had American foul brood. Before completing the deal for the bees he investigated the alcohol-formalin treatment for diseased combs and decided to use it on the extracting combs, for he did not know how many of these had been on diseased colonies. But when the bees were unpacked last spring an examination revealed that he had purchased more than he had bargained for. The number of diseased colonies kept mounting as the examination was extended until a total of over 300 were found, many of them having the disease in advanced stages.

Instead of giving up in desperation as many would have been inclined to do, Mr. Barber decided to treat these 300 diseased colonies and try out the alcohol-formalin solution on more than 3000 combs containing American foul brood in various stages. His results were so successful that he began purchasing diseased colonies in his locality, so that he has no doubt treated more colonies for American foul brood during one season than any one has ever done before. He does not know exactly how many colonies he has treated during the season, but the number of combs that had been sterilized at the end of the season is well above 6000.

Naturally in this wholesale treatment of diseased colonies, Mr. Barber worked out a system of treatment to reduce labor as well as to reduce the chances of reinfection. In both of these respects he has made a remarkable record. Not only has he worked out many short cuts in treatment, but, so far as he has been able to determine, there has not been a single case of recurrence of disease in any treated colony.

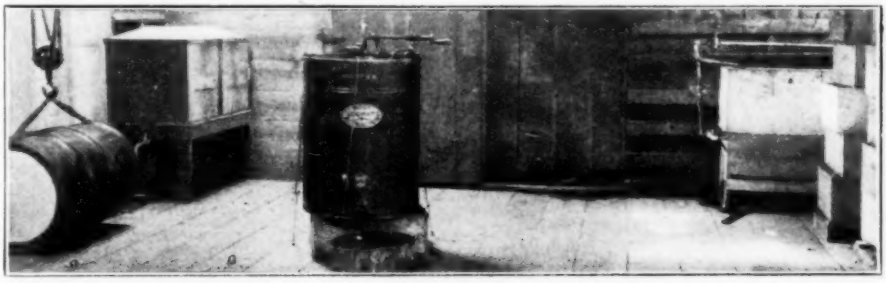
How Diseased Colonies Were Treated.

As fast as the diseased colonies were discovered they were marked, then in the evening loaded on to a truck and hauled to a hospital yard located in an isolated place away from other bees. When enough of these had been assembled in the hospital yard for a good-sized job in treating, all were treated on the same day. First, the queens were found and caged. Next, the bees of each colony were brushed from their combs into a large box, and as these accumulated they were dipped up and put into packages after the manner of preparing package bees for shipment. Early in the season two-pound packages were formed and later three-pound packages, thus making increase in preparation for the buckwheat honey flow. Two frames of foundation were put into each package. As

the packages were formed, each one was given a young laying queen if available; but if not enough young queens were on hand to go around, some of the old queens that had been taken from the colonies were given back temporarily until young queens could be reared and introduced.

As the bees were brushed, the combs containing brood were assembled in hive bodies which were tiered up as tall hives in the apiary to catch the field bees and others that were drifting about. In this way the younger bees were put into the packages, while the older ones entered the hives containing the brood. Since all colonies were treated at one time it did not matter how much drifting took place, and in the evening all of the drifting bees were crowded into the hives composed of the tiered-up chambers of brood.

The packages of bees were then loaded on the truck to be taken to the central plant, where they were placed in a well-ventilated dark room for 48 hours before taking them to an out-apiary. All the combs not containing brood were assembled in hive bodies and taken along to the central plant where the honey was extracted and the combs sterilized as described later. After 48 hours in the dark room the packages of bees were taken to an out-apiary and put into hives in the ordinary manner. In addition to the two frames of foundation, each of these colonies was then given two combs from diseased colonies that had died during winter, the combs having been previously sterilized. Three days later the hives were filled out with sterilized combs to complete the set.



Arrangement of apparatus for sterilizing diseased combs. The combs to be treated are first brought to the extractor (center) where any honey they contain is extracted. They are then placed in the tank at the right to be washed. After which they are again put through the extractor to remove the water before being placed in the sterilizing tanks shown at the left.

How the Diseased Combs Were Treated.

When the brood left in the tiered-up hives in the hospital yard had emerged, the bees were shaken from these combs into a large box and as these accumulated they were dipped up into packages as before. The combs were then taken to the central plant for treatment and the packages placed in the dark room for 48 hours, then taken to an outyard in exactly the same manner as the previous lot. The diseased combs were taken to the extracting room where the apparatus for treating the combs was installed.

The first step in the treatment was that of extracting the honey from the combs, care being taken in uncapping to be sure that every cell was uncapped. This is extremely important because the disinfectant does not penetrate the cappings. The honey was stored in 60-pound cans to be sterilized and fed to the bees during the heavy breeding period next spring when boiled honey can safely be fed to the bees, thus avoiding any chance of any such honey being in the winter stores.

After the honey was extracted, the combs were placed in the tank shown below at the right, where they were immersed in water and held down by heavy pieces of iron. It is well known that water does not enter the cells when a dry comb is immersed, but it does enter the cells that are wet with honey. Therefore, every cell which contained honey before extracting is soon filled with water when the combs are immersed.

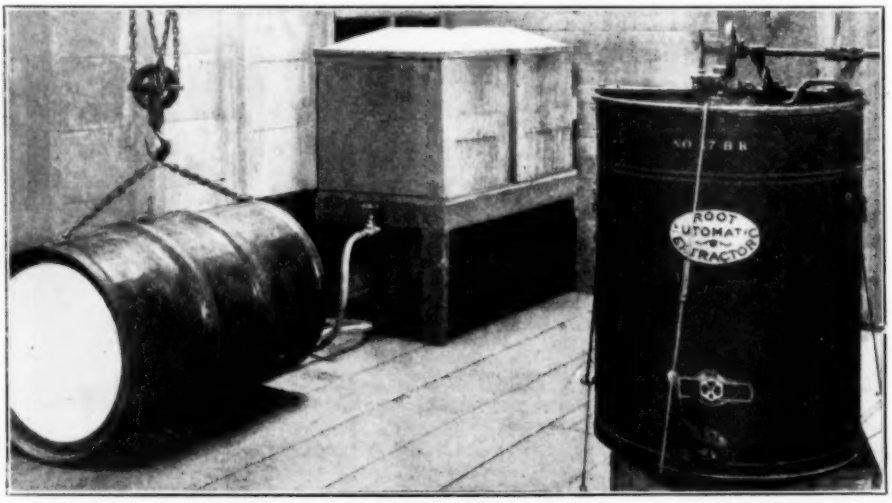
After an hour or two the combs were taken from the water and most of the water shaken from them back into the tank. They were then put into the extractor where the rest of the water was thrown out, care being taken that this water was disposed of where no bees could have access to it. The purpose of washing the combs is to remove the residue of honey to keep it out of the disinfecting solution, where it would tend to make the combs sticky. The combs were then ready to be sterilized.

For this purpose two tanks were used, each built to hold 32 combs. The tanks are deep enough to hold two tiers of

combs. To prevent the combs from floating, they are held down by angle irons riveted to the sides of the tank in such a position that the projecting top-bars of the frames catch under the angle iron at each end. These angle irons are a little shorter than the tank so that the last comb in the tier can be hooked under them. The combs are placed in the tanks before the disinfecting solution is put in.

The method of filling the tanks with the solution is shown below. These tanks are connected by means of a pipe below so that they are filled from the bottom. By means of the chain hoist the 50-gallon drum containing the alcohol-formalin solution is raised to a level above the top of the tank. The drum is connected to the pipe below the tanks by means of a rubber hose so that the liquid flows into the tank from below when the valve near the tank is opened. When both tanks are full and all of the combs are covered with the liquid, the valve is closed and the drum lowered to the floor. The combs are left immersed in the solution for 48 hours, after which the valve is opened to permit the solution to flow back into the drum. The tanks are kept covered meanwhile to prevent any slight evaporation. The combs are then taken out of the tanks, and, as each is lifted, most of the liquid is shaken from it by holding it in a horizontal position and shaking first one side, then the other. They are then placed in the extractor, and as much as possible of the remaining liquid is thrown out. About three quarts of the solution is obtained from 64 combs. This is poured back into the tank. The combs are then aired for a week before being given back to the bees.

More than 3000 diseased combs, many of them almost completely filled with American foul brood scales and many fairly rotten, were thus treated and given back to the bees without a single recurrence of the disease. The apiary shown on page 716 was made up of colonies that had been treated, and their combs given back to them. Several of us made a careful examination of this apiary on September 25, but we were not able to find a single cell of American foul brood. To see these old combs, that had been rotten with American foul brood in May, now containing healthy brood was indeed an inspiring sight. The illustrations show several of these. Mr.



The two rectangular tanks on the bench are built to hold 32 combs each in two tiers. The steel drum contains the alcohol-formalin solution (50 gallons), and is connected by a rubber hose with the pipe opening into the tanks. After filling the tanks with combs, the steel drum is raised by the chain hoist and the valve near the tanks is opened to permit the solution to fill the tanks. The valve is then closed and the steel drum lowered to the floor. To empty the tanks, the valve is opened to permit the solution to flow back into the drum.

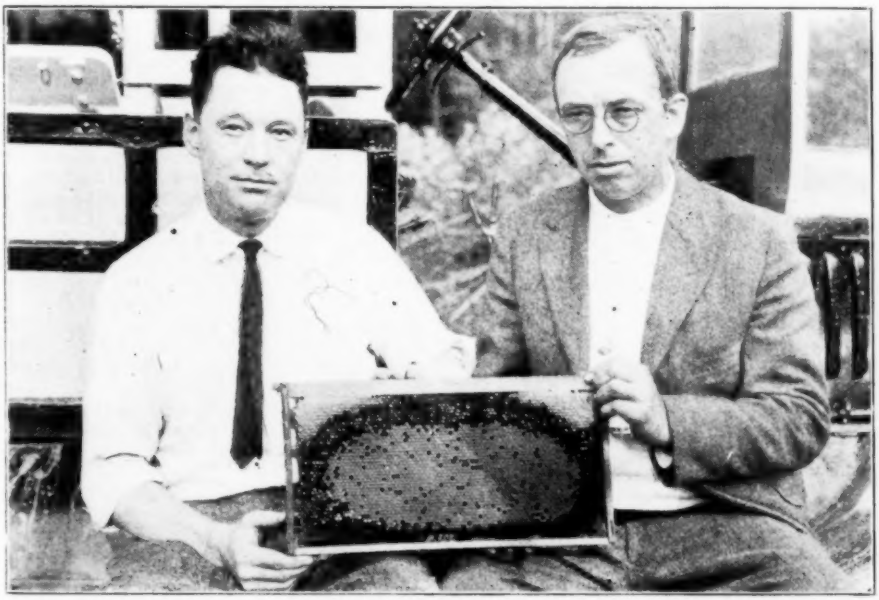
Barber assured us that in May all of the combs here illustrated were either filled with American foul brood scales or were rotten with decaying pupae. He also showed us some of the combs from recently treated colonies (that he had purchased) before they were put through the solution. They could not have been worse specimens of American foul brood, but after immersion in the solution they are again as good as new.

To clean up such a mess of disease as Mr. Barber found on his hands last spring when over 300 colonies were treated and not have a single recurrence of disease is

a feat which, it is safe to say, no one else has ever accomplished. He realized the enormity of his task and was careful to make a thorough job of it. He took no chances of the disease being given back to any of the colonies by means of the hive, so the hive parts were boiled in a large steam-heated tank for 35 minutes. About 1800 hive bodies were treated in this way, as well as the other hive parts.

Treatment Cost Less Than 3c Per Comb for Material.

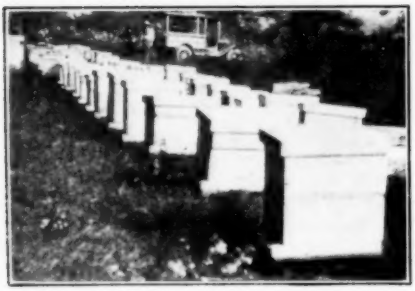
Since the alcohol-formalin solution does not lose its strength from use, it can be used over and over again. However, there is some loss of liquid during the process, because the combs are still wet with the solution after having been run through the extractor. To bring the liquid above the combs when a new batch of diseased combs is placed in the tank for treatment, Mr. Barber says that with his outfit about a gallon of new solution needs to be added every time the tanks holding 64 combs are filled. He had 125 gallons of the solution at the beginning and on September 25, after having treated about 4,000 combs, he had 45 gallons left, thus having used 80 gallons, or about a gallon for each 50 combs. His figures show that the cost per comb for material was less than three cents. This does not include the labor of treating the combs. He has no figures on this, because the work was done mornings and evenings before or after the work in the yards. He says that it takes from an hour to an hour and a half to do all of the work connected with sterilizing one batch of 64 combs. It will thus be seen that, when the labor is figured in, the cost is still below four cents a comb after the equipment is installed, when the solution was purchased at a low wholesale price. No doubt, operating on a smaller scale would increase the cost per comb, but, in such cases, smaller tanks can be used so the stock of the solution would be reduced accordingly. The unused portion of the solution can be saved from year to year.



Dr. J. Hutzelman (right), the man who developed the alcohol-formalin method of sterilizing diseased combs, and O. E. Barber (left), the man who demonstrated its practicability on a large scale. They are holding one of the 3000 treated combs which was filled with American foul brood scales and dead pupae before treatment in May. When the photo was taken (Sept. 25) the comb was well filled with brood all of which was apparently in perfect health.

The Action of the Alcohol-Formalin Solution.

In this solution the formalin is the active agent in destroying the spores of American foul brood. The alcohol is simply the vehicle which penetrates into the comb. Since alcohol has a low surface tension, it is capable of promptly filling all empty space in the combs. In other words, unlike water it spreads inward along the cell walls and forces the air from the cell. In this way the active agent, formalin, is carried even into the

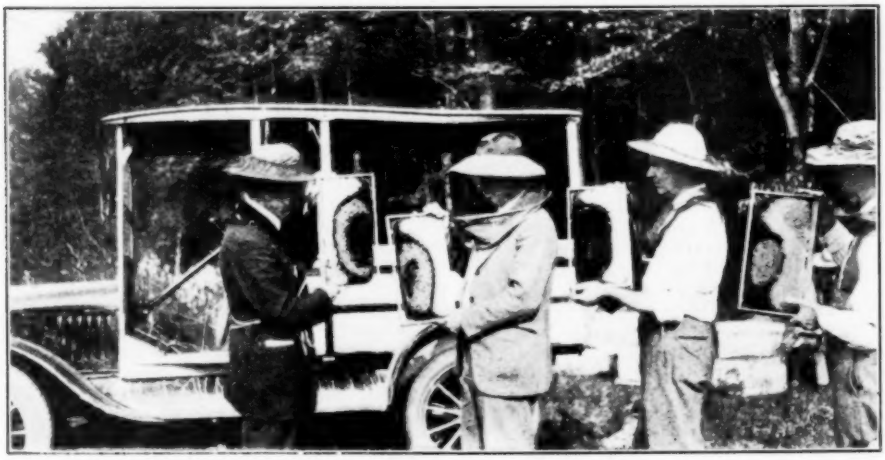


One of Mr. Barber's apiaries on treated combs. Of the 60 colonies in this apiary, 50 were treated for American foul brood in May and all the colonies were given back treated combs that had previously contained disease. Not a single cell of disease was found by careful inspection on September 25.

innermost recesses in the comb. It is also able to dissolve portions of the scale of American foul brood and penetrate completely through them. Since the solution penetrates wax, propolis, pollen and the remains of the dead larvae or pupae, whether in a dried-down form or ropy mass, the combs are easily cleaned after treatment. Much of the foreign material is thrown out by the extractor when the combs are taken out of the solution, and any that remains is easily cleaned out by the bees as so much inert matter. Fortunately, neither the alcohol nor the formalin has any damaging effect upon the wire or the wood; and while the wax of the comb is slightly penetrated by the material, the combs after airing are not rendered objectionable to the bees. In fact, Mr. Barber states that the queens showed a preference for these combs over untreated combs. Another strange thing, he says, is that the wax moths have not bothered any of the treated combs when stored away from the bees during the summer. The alcohol-formalin solution is, therefore, a fortunate combination for treating combs containing American foul brood.

A peculiar thing was discovered when Dr. Hutzelman sent samples of treated combs to the Bureau of Entomology at Washington, D. C. Cultures made from samples that had been treated only 12 hours showed germination; but the appearance of the organisms was abnormal, and when such combs were placed in healthy colonies no disease was produced. After 48 hours in the solution, there was no germination or growth in the laboratory tests. In this way a laboratory test of a treated comb, that had not been treated long enough, could easily show positive results, while a test in the apiary shows negative results.

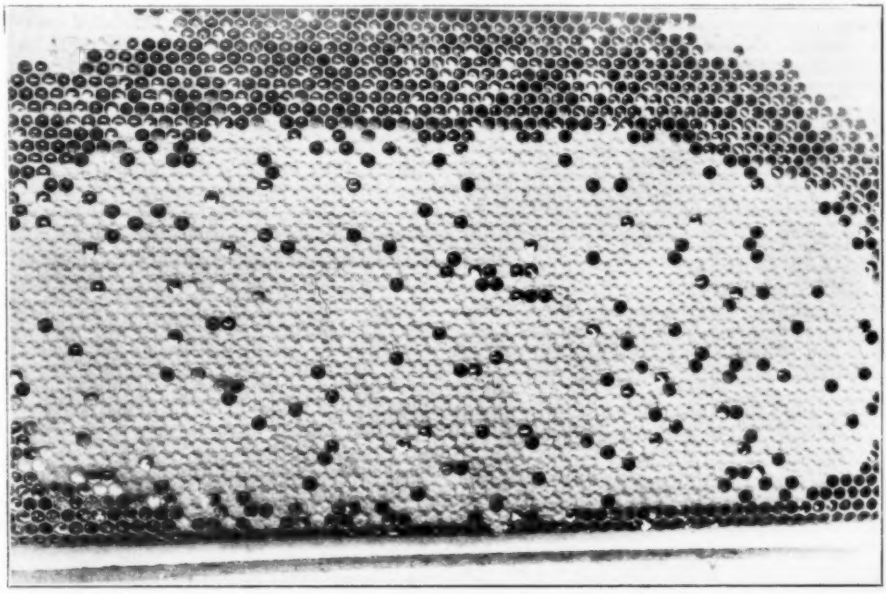
Another disinfectant for American foul brood, sodium hypochlorite, which was first mentioned as a treatment for European foul brood by W. H. Lewis, Edmonds, B. C., and described in the February, 1922, issue of this journal, was found by Prof. H. F. Wilson, University of Wisconsin, to be effective in the destruction of the spores of American foul brood. Thus far this material is not recommended for disinfecting brood-combs containing American foul brood but is used for spraying extracting combs or hive parts. As we understand it, sodium hypochlorite will dissolve the scales of American foul brood and sterilize the combs; but since oxidation takes



Left to right, Geo. S. Demuth, J. C. Hutzelman, O. E. Barber and E. R. Root. These men carefully inspected the apiary shown above made up of treated colonies to which sterilized combs had been given. They did not find a single cell of disease. The combs they are holding were rotten with American foul brood last May but contained only healthy brood when the inspection was made.

place rapidly the solution can not be used over and over again as can the alcohol-formalin solution, thus making it necessary to use it in the form of a spray which is not as penetrating as immersion in the alcohol-formalin solution. Perhaps further research with this material will point the way to its use in disinfecting brood-combs containing disease, as well as extracting combs and hive parts.

The tremendously important fact now established is that it is no longer necessary to destroy combs containing American foul brood. Beekeepers certainly owe a debt of gratitude to Dr. Hutzelman for his research work in developing the alcohol-formalin solution and to Mr. Barber for demonstrating so conclusively that this disinfectant can profitably be used in a practical way in cleaning up American foul brood. The remarkable achievement of these two men will stand out as one of the milestones in the development of the beekeeping industry.



A "close-up" of healthy brood in one of the combs that had been sterilized. This comb is one of the blackest to be found in the apiary shown on the previous page. Mr. Barber says that this comb was filled with American foul brood scales and decaying pupae before treatment but not a trace of disease was found after treatment. The white spots in the open cells in the cut were caused by reflection of sunlight from the recently gathered nectar from the fall honey flow.

Some have expressed the fear that careless beekeepers might try disinfecting their combs and spread the disease because of faulty application of the treatment. Mr. Barber is strongly of the opinion that there is less danger when the combs are immersed in the alcohol-formalin solution for 48 hours and used again, even in the hands of the careless, than when the ordinary shaking treatment is given and the combs disposed of in the ordinary careless manner. It would scarcely seem possible for any one to make a worse mess of treatment when the combs are sterilized than some do who attempt to treat and melt up the combs. Often diseased combs are stored away during the rush of work in the busy season until there is time to melt them for wax, resulting in bees gaining access to them and scattering disease broadcast. Where the greatest care is needed in sterilizing the combs is in extracting and handling the honey which they contain, but the chance of spreading disease by carelessness in doing this should not be greater than in cutting through honey at the top-bar when cutting out the combs to melt them.

Perhaps the inspectors can work out a plan whereby the more careful will be given a permit to disinfect their combs, while others will be compelled to burn them.

However this may be, this latest development in the treatment of American foul brood is only another illustration of the present tendencies in beekeeping by which it is becoming more and more technical. This will ultimately result in the elimination of the careless and put the industry in the hands of those who take sufficient interest in it to do their work carefully.

LOSS OF VITALITY IN FALL

Importance of Protection During the First Phase of Wintering

By F. B. Paddock

Professor in Beekeeping, Iowa Agricultural College

THE problem of wintering is not ordinarily subdivided by the beekeepers into its various phases. Briefly, we could consider wintering to be composed of at least three definite phases. For our purpose, it may be assumed that colonies begin wintering approximately October 10 at the latitude of Ames, Iowa. Previous to this time the operations of both the bees and the apiarist are directed toward the best possible colony organization to withstand winter conditions. A great many beekeepers do an extensive feeding after October 10. However, colonies in need of feed this late in the season must be considered somewhat subnormal.

The Three Phases of Wintering.

From October 10 until approximately November 20, the bees at the latitude of Ames were more or less quiet, enjoying frequent flight days, but on the whole, forced to consume stores with which to correct temperatures that occur below the optimum for the colony prosperity. Since cellar protection has been the most common form, the second stage begins approximately November 20, and ends approximately March 15. The third phase begins when the bees are taken out of the cellar and ends when brood-rearing starts.

It is with the first stage that the following observations have been made. In the usual consideration of the wintering problem, the beekeeper feels that the entire loss of the colony takes place during the actual period of protection, or while the bees are in the cellar. In any windy territory, the bees are forced to excessive activity during a great portion of the first stage of wintering.

Three colonies were under observation in connection with the notes made for this paper. Colony No. 11 was built during the season of 1921 from a three-pound package, which was installed May 1 on combs in a Modified Dadant hive. The development was above the average during the season, and at the end of the honey flow the colony was rated as excellent. However, at the beginning of the first phase of wintering, the colony was found to be deficient in stores. During the period of October 14 to November 23, this colony lost a total of four pounds, weighing at the beginning 73 pounds, and at the end 69 pounds.

Colony No. 177 originated as a swarm of black bees which was hived May 20 on combs in a Modified Dadant hive. During the season it produced a very good crop of honey, and at the close of the honey flow was rated as excellent. At the beginning of the first phase of wintering, this colony was found to be deficient in stores, weighing only 73 pounds. During the period of October 14 to November 23, this colony lost four pounds as did colony No. 11.

Colony No. 222 originated as a three-pound package the same as No. 11, and during the season stored a very nice amount of surplus honey. At the end of the honey flow this colony was rated as excellent, but at the beginning of the first phase of wintering was considered deficient in stores. The weight at that time was 74 pounds, and at the end of the first phase it weighed only 71 pounds, showing a loss of three pounds.

Losses Increase as Temperatures Decrease.

It is interesting to note that these colonies did not lose any until after October 23, or at the end of nine days. During this time there had been a very decided drop in temperature from 67° to 46°, and on two occasions it dropped to 43°. The first loss on colony No. 222 was between October 22 and 23 with one pound. The first loss in colony No. 177 was between October 24 and 25 with two pounds. In contrast with this, colony No. 11 did not lose any as the result of these temperature conditions.

The next loss in the colonies was noted on November 5. Between the last loss and this one, the temperature had been getting consistently lower, both the minimum and the maximum. The lowest temperature recorded was 33°, and the average maximum temperature was 66°. Colony No. 222 was first to lose again, indicating a loss of one pound. As before, colony No. 177 lost one day later than colony No. 222 with one pound.

There was no loss recorded of any of the colonies from November 7 until November 19. Colony No. 11 lost again with one pound, as did colony No. 222 with one pound also. At this time there was a very decided drop in temperature to 20°, and the maximum daily temperature was averaging about 40°. As in the two former instances, the loss recorded in colony No. 177 occurred one day later than colony No. 222, showing a loss of one pound. The minimum temperatures reached the extreme at 18° on November 22. At this time colony No. 11 showed a

very decided loss. On November 23 when the bees were moved to the cellar, colony No. 11 weighed 69 pounds, colony No. 177 weighed 69 pounds, and colony No. 222 weighed 71 pounds.

There are some very interesting facts coming from these data. Colony No. 11, of the Italian race of bees, originated as a package, and colony No. 177 of the black race, originated as a swarm, lost exactly the same amount, i. e., four pounds. Colony No. 177, black, and colony No. 222, Italian, showed losses of the same amount at a difference of one day on two occasions. During this entire period, the weather was what could be termed unfavorable for bee flight. After November 7, there was only one maximum temperature recorded above 50°. The bees did attempt flight on November 20, with the maximum temperature of 43°.

These colonies were continued on scales throughout the winter in the cellar, which will be discussed in another paper. All of these colonies made a good record during the season of 1922. While the loss during this period may not seem excessive, yet it must be regarded as an important factor in the larger problem of wintering.

Methods of Avoiding Fall Loss.

During the first phase of the wintering period, the climate is always erratic. This condition is made up of a wide range of temperature and places of cold wind exposure. The first factor is exceedingly trying on the bees, especially during the latter portion of the first phase. At those times, the temperatures are such that the bees are often called upon to form a cluster, which may be broken later by a temporary high temperature. The exposure to wind is especially trying to a colony of bees. Because of these adverse conditions, it is advisable for the beekeeper to save as much as possible for his bees. Whenever it is possible to do so, the bees should be located with reference to a natural windbreak, such as a row of trees, a high board fence or even a south or east slope of a hill. If a windbreak is not available for the apiary, it is possible to construct a portable one at a very moderate cost. Such a windbreak can be patterned after the snow-drag fences used by the railroads. The windbreak which has been constructed at the Iowa Experiment Station has a total height of approximately seven feet. The results obtained by the use of this windbreak have been highly satisfactory.

For the beekeeper who winters his bees in the cellar, the all-important question is to get them into the cellar as late as possible but as soon as possible after a good cleansing flight. Needless to say, this operation causes considerable anxiety, and the best procedure for the beekeeper is to keep in close touch with the Weather Bureau forecast. In Iowa it is possible to receive the forecast three times a day. In addition to this, a good many stations have 24-hour service, and by special arrangement it is possible to have the Weather Bureau telegraph the approach of a severe storm at about the time the bees are supposed to be in the cellar. Unless such co-operation is sought, the beekeeper would often find himself waiting indefinitely for a good bright day just before a severe storm. Under these conditions, the bees will go into the cellar under a handicapped condition.

Ames, Iowa.

MOVING BEES INTO CELLAR

Using a Motor Truck for Putting Bees into the Winter Repository

By M. J. Deyell

Foreman of The A. I. Root Co's Apiaries

MOVING bees into a bee-cellar means physical and mental labor, with the emphasis on the physical. We winter about 400 of our 1500 colonies in a bee-cellar because the 400 colonies are in single-walled hives and also because we have a good bee-cellar. While we do not generally advocate cellar-wintering, especially this far south, we know that very gratifying results have been obtained in cellar-wintering of bees even in the latitude of northern Ohio.

Our bee-cellar is located at one end of the bee-supply-warehouse basement. The cellar is constructed entirely of concrete. The ceiling is on a plane with the surface of the ground just outside the cellar. In order to prevent rapid changes of temperature within the cellar, from four to six feet of earth was placed directly over the cellar, forming a mound. Having the earth piled higher over the center than over the walls of the cellar causes the water to drain off readily. The inside dimensions are 60 feet long by 12 feet wide by 6½ feet high. There is one door opening into the cellar from the warehouse basement. One outlet ventilator, 15 feet high by 8 inches in diameter, is located on one end of the cellar. The

intake ventilator for fresh air is located in the door of the cellar and so constructed that either air from the warehouse basement or air from outdoors can be admitted. There is also a fan built in the door for forcing fresh air into the cellar if necessary.

Preparation of Colonies for the Bee-Cellar.

The preparation of the colonies for the bee-cellar is quite similar to the preparation of colonies for outdoor wintering. For cellar-wintering the packing of the hives is of course unnecessary, but the quality and quantity of stores and also the strength of the colonies count in successful cellar-wintering as much as in successful outdoor wintering. From an experiment made on a number of colonies in single-walled hives last winter, a part of the colonies wintered in the cellar and a part of them wintered outside, it was found that colonies in the cellar consumed about five pounds less honey per colony than colonies wintered outdoors. It is well, however, to have not less than 40 pounds of stores of good quality for each colony to be cellar-wintered. If the quality of the honey stores is at all questionable, a 10-pound pail of thick sugar syrup should be fed to each colony to correct this deficiency. It is true that colonies under average strength may be successfully wintered in a cellar, but it pays to have nothing but strong colonies ready for the cellar.

The Correct Time to Put Bees in the Cellar.

There is usually a day during the latter part of November when the bees have a good cleansing flight. This day, as a rule, follows a cold spell, and the bees, anxious for a flight, will leave the hive and void their feces. Right after this flight is the time to put the bees away. It is preferable to have a cool day for moving the bees. In some sections of the country where cellar-wintering is practiced quite generally, some prominent beeman of the community gets in touch with the Weather Bureau, which supplies information regarding future weather forecasts. As it is possible to know quite definitely three days ahead what the weather is likely to be, this beeman obtains the desired information and passes it on to the beekeepers throughout that section of the country by telephone. Records show that the day for moving bees into the cellar occurs on or about November 20.

Our Method of Moving Bees Into Cellar.

For moving bees into our cellar we use a large two-ton truck which will accommodate 90 colonies in single-walled ten-frame hives. On the day previous to moving the bees, an entrance screen is placed on top of each hive to be moved and an examination of the hives is made to know if the bottoms are stapled on securely. Early in the morning of moving day, these wedge-shaped screens are placed in the entrances of the hives and fastened with staples. Two men carry the colonies to the big truck, and one man does the loading. We instruct our men to handle the hives as they would handle crates of eggs or dynamite. The truck driver fairly crawls along with the load of bees on the way to the bee-cellar. The hives of bees are then unloaded from the truck on to hand trucks and wheeled to the warehouse on to the elevator and down to the basement of the warehouse into the bee-cellar. The hives are piled four or five high in rows.

In carrying the hives to the truck the cover is brought against the chest as shown above. This brings the weight close to the body, making it easier to carry than when the weight is farther away.

Passages are left between the rows of hives to permit inspection during the winter months. The entrance screens are left in the hives for a few hours after the last of the bees have been placed in the cellar. This is done to allow the colonies to quiet down so that the bees may not rush out of the hive at the time the screens are removed.

Our cellar is equipped with two electric lights, which are turned on to facilitate the work of placing the bees. When we remove the entrance screens, the electric lights are turned off and flashlights are used. The bees, after being placed in the cellar, are likely to be restless for half a day and then they will gradually become quiet.

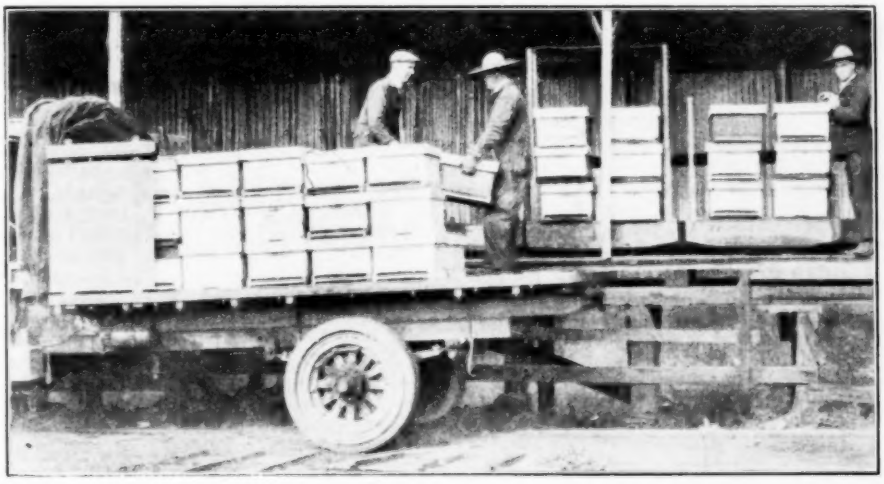
Some Observations Regarding Putting Bees in Cellar.

An ideal location for a bee cellar is right in the center or at the side of the apiary. The colonies should then be carefully carried and placed in the desired position in the cellar without the use of entrance screens. The location of our cellar makes it impossible to move and handle colonies as we would like. As already stated, we use every possible precaution against rough handling, but in spite of these precautions the colonies will frequently become unduly aroused. We have often wondered if the colonies thus aroused in the process of moving could and would winter as well as colonies handled in an ideal fashion, but our experiences during the past six years in cellar-wintering have led us to the conclusion that no serious losses have resulted from jarring bees when moving them into the cellar. In order that we may be absolutely sure of this we are planning this fall to weigh 10 colonies and carefully carry them into the cellar; then weigh the colonies when they are removed from the cellar next spring. A comparison of these colonies will be made with 10 colonies of equal strength weighed when put in and when removed from the cellar, but hauled to the cellar by truck.

Loss of Weight of Colonies During Winter.

Five colonies in single-walled hives with honey stores, cellar-wintered.

	Weight Nov. 15.	Weight Apr. 15.	Loss of weight
Colony No. 1.....	65½	51½	14
Colony No. 2.....	66	49½	14½
Colony No. 3.....	59	44½	14½
Colony No. 4.....	64½	64½	14
Colony No. 5.....	63¾	43	20¾
Total			77¾
Average loss.....			15.5



The hives are loaded on hand trucks which are pushed to the elevator, lowered to the basement and pushed into the bee cellar. The hives are then simply lifted from the truck and put in place in the piles.

Colonies in single-walled hives, cellar-wintered, each fed a 10-pound pail of sugar syrup:

	Weight Nov. 15.	Weight Apr. 15.	Loss of weight.
Colony No. 1.....	72	57	15
Colony No. 2.....	70¼	55	15¼
Colony No. 3.....	71½	50	21½
Colony No. 4.....	63½	50	13½
Colony No. 5.....	66¼	52	14¼
Total			79½
Average loss.....			15.9

Five colonies in single-walled hive wintered outdoors with honey stores:

	Weight Nov. 15.	Weight Apr. 15.	Loss of weight.
Colony No. 1 (died during winter).			
Colony No. 2.....	73	53	20
Colony No. 3.....	66	43½	22½
Colony No. 4 (died during winter).			
Colony No. 5.....	71¾	54	17¾
Total			60¼
Average loss.....			20.08

A study of the tables on page 721 will show that some experimental colonies wintered in the bee-cellar consumed considerably less stores than colonies wintered out-of-doors. It will also be noted that the loss of colonies in outdoor wintering in single-walled hives was 40 per cent. Referring to the record of the five colonies wintered in the cellar and each colony fed a ten-pound pail of syrup, we supposed that the loss in weight would be less per colony than in the colonies cellar-wintered on honey stores. We are, however, giving out the results exactly as we found them.

The three important factors to be kept in mind in connection with putting bees into a bee-cellar are: first, colonies should be strong in bees; second, colonies should have not less than 40 pounds each of good stores; third, bees should be put into the cellar about November 20 directly following a good cleansing flight.

It usually takes one day for five of us to put 400 colonies into the cellar. We like to do all the moving at one time rather than to do it piecemeal.

Medina, Ohio.

MANY USES FOR BEESWAX

Some of the Finer Points in Rendering and Disposing of this Product

By Josephine Morse

BEESWAX, if well rendered and of a clear, bright color, is one of the most attractive by-products of the apiary. It is hardly worth while for a beekeeper to try to render wax from old, dark brood-combs, for not enough can be obtained to repay one for the energy or time expended, and it is a dirty, "mussy" job at best. Most beekeepers who have any number of combs to melt up prefer to send them to a foundation manufacturer to be turned into foundation. But it is a different matter to melt up cappings from the uncapping-can. From these cappings, fine, light yellow cakes of wax can be obtained with comparatively little trouble.

The first step in rendering wax from cappings, after they have been very thoroughly drained, is to wash them well so there is no stickiness left. Then they can be melted in hot water over a slow fire, and, when cool, the cake of wax, with all dirt and impurities adhering to the bottom, can be removed. Straining is then in order. The cake of wax must be melted once more—not in water this time—and, when liquefied, strained through cheese-cloth into suitable receptacles. I use a small, coarse wire mesh strainer with a piece of cheese-cloth laid in it. The cheese-cloth is replaced whenever clogged with dirt.

A Simple Wax Extractor.

O. M. Smith, veteran beekeeper of western Massachusetts, uses a simple method of securing A1 wax from cappings. He has a large, square tin vessel, with a tight-fitting cover made as large and high as possible to fit in the oven of his kitchen stove. A little water is run in the bottom of the tin, and the dry cappings are placed in a large cheese-cloth stretched across the top and hung down inside so as nearly to touch the top of the water. The cover is put on tight, and in the evening the whole thing is pushed into the oven and left all night. In the morning it is taken out, and a beautiful, clean cake of wax will be found on top of the water, where it had strained down through the cheese-cloth while the oven was hot during the first part of the night. There will be hardly any need to strain this wax again; but, as the large, square form of cake may not be desirable, it will be an easy matter just to strain it once more after it has been melted preparatory to pouring into the desired moulds.

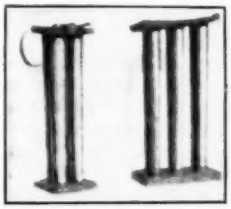
Now, a word about moulds! They must flare. Even a very, very slight flare will be sufficient. They may be of tin or copper or crockery. The most practical are of tinware. Patterns in this country are not very varied; sometimes an odd mould in the shape of a butterfly or a cloverleaf may be picked up among high-grade articles of kitchenware—probably imported from France, for the French, as a people, are very fond of "dressing up" things fancifully. Particularly do they like to use moulds for a great variety of their foods. However, even if we can not find the odd and charming moulds for our beeswax that we would like, we can easily be content with little, scalloped muffin tins for small cakes, or a big, new bread tin for a 5-pound cake—all obtainable at the 5 and 10 cent store!

Wax with smooth, well-rounded edges is preferable to that with hard, brittle ones that chip off easily; these may be produced by pouring the wax into the moulds when it is just as cool as it can be, and yet be "pourable." This is particularly important when making a large

cake of wax, as it will be very liable to crack if poured when very hot.

Various Uses for Beeswax.

There is a certain demand for beeswax by interior wood-finishers. The wax is heated and turpentine added and stirred in as it cools. Different workmen use different proportions. As a floor finish, a beeswax and turpentine paste, well rubbed in and given high polish, has no equal. It is not for lazy people, however, as an important requisite in its use is "elbow grease."



Old-fashioned candle moulds.

Small cakes weighing less than an ounce are often sold for use in sewing baskets. Those who embroider professionally sometimes like to get a cake of white or very light beeswax.

Dentists in large cities pay very high prices to their dental supply houses for the beeswax with which they make impressions of the mouth in bridge and plate work. It is supplied in cakes, only about ⅜ of an inch thick, convenient for their work. It is sold to the dentists for about twice what the beekeeper gets for his wax anywhere. Here is a suggestion for an outlet for some of the beekeeper's nicely rendered wax, which at times seems to him something of a drug on the market. Let him mould it in the thin cakes, which are desirable for dental work, and sell direct to the city dentists at a little less than the supply houses.

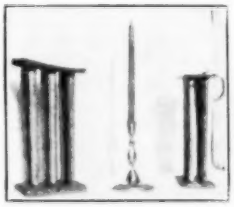
Sticks across the top hold wicks in place before wax is poured in.

At a lecture on "Grafting," at the Massachusetts Agricultural College, Professor Sears of that institution urged fruit-growers to be sure, when they made their grafting wax, to use real "bees" beeswax. His rule for making grafting wax is: 4 parts resin, 2 parts beeswax, 1 part (by weight) linseed oil.

Candles Made of Beeswax.

The most attractive way in which to mould wax is in candle form. They can be dipped or made in the old-fashioned candle moulds used by our grandmothers or great-grandmothers, and, whichever way they are made, can be things of beauty and pleasure. Especially well do they look in gleaming brass candlesticks. The Roman Catholic church uses candles made of pure beeswax exclusively. The beeswax, however, is bleached white or cream color and so loses the beauty of its natural color. Many of the seminaries for training missionaries in that church keep bees just for the purpose of supplying their chapels with beeswax candles, and incidentally their table with honey. An immense candle of beeswax, placed in the church in Italy where Caruso, the world-famous tenor, is buried, is lit on all holy days and feast days and on the singer's birthday. Calculations have been made that it would last a thousand years if burnt continuously; so it is an interesting conjecture to ponder how long it will be, under the arranged program of lighting, before the last bit of wick is consumed.

Dipping candles is rather a long process, but not an unpleasant one. Unless you make only a few at a time, a good deal of wax is necessary as the dipping vessel must be as deep as the candle is to be long, and wide enough for convenience in working. Usually three or four candle wicks are hung from one bar and dipped in the hot, melted wax and then the bar is hung up on a couple of pegs for the wax to harden. Several bars can be kept at work, dipping in turn, always being sure that the last coat of wax is thoroughly hardened before dipping again. Wicks may either be braided with three strands of candle wicking or a couple of strands may be twisted together into a rope. Whatever way the wicks are made, one sample candle should be burnt, to be sure they burn satisfactorily before they are sold or given away.



The finished product.

If you haven't an old candle mould of your own, perhaps you can find one in some one else's attic or at an auction. They were usually made for moulding six candles at a time—six cylinders in a double row, tapering slightly toward the bottom where there is a little hole to let out the end of the wick. The moulds are about nine inches tall and flare so that, as the wax cools and contracts, the candles will slip out. If there are dents in the moulds or they are not clean, the slipping will not be so easy. Stringing the wicks in place is simple, but should be done with care and precision so that

they run right straight down through the center of each candle. The round sticks are laid lengthwise across the centers of the candle holes on the top. If braided wicks are used, one end is fastened to one of these sticks. The other end is threaded in a coarse tape needle and passed down, through and out the small bottom hole, and knotted tightly there so that the hole will be blocked. The easiest and quickest way to make a wick is to take a strand of wicking a little more than twice the length of the candle, loop the middle of it over the stick, thread the two ends in the needle, draw through the bottom hole, twist together and knot. When the wax is thoroughly hardened (leave it 24 hours to be sure), the knots may be cut and the two sticks lifted up, with three candles hanging on each.

As wax contracts more on cooling when poured very hot than when poured at as cool a temperature as it will run, it stands to reason that the candle moulds should be filled with very hot wax and put at once in a cool place, in order that the candles shall contract sufficiently to slip easily out of the moulds. If the outside of the candles are at all rough, they may be dipped once or twice to give a fine, smooth, polished surface.

Besides the beekeeper's pleasure in turning out a finished product, there is an added advantage in the fact that these candles are readily salable and very welcome as gifts.

South Lancaster, Mass.

SLOGANS, AN AID TO SALES

How Advertising is Made More Effective by a Catchy Honey Slogan

By Frank V. Faulhaber

ONE beekeeper who is selling honey on a small scale intimated that he would use a distinctive slogan in the interest of his business. "Something to direct attention to my product," he made known as his object. "I think beekeepers don't advertise enough at all. At the same time, I believe special efforts should be made to increase the demand for honey in all circles. For that reason I am about to devise some sort of slogan which I shall utilize in various ways—in circulars, advertisements in newspapers, labels to be attached to containers, etc."

His decision, indeed, hints a very intelligent procedure. And what beekeeper is not now interested in selecting some suitable advertising slogan? Surely, through its use, demand for honey can be materially stimulated. Results attending the use of slogans in other businesses attest the real worth. Many goods, that formerly brought about seasonal purchases largely, command year-around trade, because some compelling slogan had been chosen. This is true in many lines. And steadily there are many other businesses, either organized or individually, that are resorting to some original distinctive saying to make products more popular.

If beekeepers the country over would get together and agree upon a certain advertising slogan, to be brought before the public in various ways, there would be an appreciable increase of business for every honey man. What has been done in other fields of this nature should warrant consideration here. But such a move may be yet far in the distance; nevertheless, the individual beekeeper should find it worth while to get together a few words that will serve to set apart his product, call attention thereto, and generally make it more popular.

It is not advisable to "Say It With Honey," or to content oneself with some other similar imitative phrasing. The beekeeper might construct something alliterative, if that is possible and desired, as for instance, "Harper's Honey Healthful," or, "Harper's Honey for Health." If such a slogan stares the people in their faces in all sorts of places, they naturally cannot help but be impressed with Harper's honey and its real goodness. And, of course, trade for Harper should increasingly develop.

"Honey for Health"; here is a slogan that should hint possibilities. It is short, crisp; it can easily be impressed upon the mind. Naturally, nothing lengthy should be used, nor anything difficult of pronunciation. A desirable slogan is such a one that the people won't easily forget; if it has a rhythmic swing to it, all the better. Let it be a slogan that the simplest person can read and grasp. For slogans that are popular, these are some pointers to bear in mind.

Sometimes a good slogan will call attention to a beekeeper's location, as, for example, "Honey Up the Hill." Here's a short collection of vocables that will suggest to the enterprising beekeeper others, one of which should enable him

to create better demand for his product, at the same time making people think of honey and his place of business as one. Naturally, when these people want honey they will instinctively think of the Hill; in time they will associate that very identical location with the product so well known there. Any thoughtful honey producer should readily enough come upon some satisfactory collection of words for his own particular purposes.

"Honey Good for the Whole Family" represents a simple enough slogan, yet should prove valuable for any beekeeper who will make a test here. Honey really is good for everybody, from the tiniest tot to the oldest grown-up; beekeepers should emphasize this truth. Any number of good, attractive advertising slogans could be evolved, certain to bring about desirable and deserved returns. Today honey is being purchased in far too small quantities, not often enough, nor does the whole family, as a rule, consume it. Why? Will not some beekeeper conceive and develop some impelling advertising slogan that will drive home to the conviction of the most doubtful that honey has a place in every person's life?

"For Honey Call Sanders." Is not here a group of words calculated to stir the most dull imagination, something that people should not easily lose sight of? Sanders may be doing a big delivery business. That is an added service. And he wishes people not to forget about that, either. On the contrary, he wants to make it easy for those interested to buy and secure honey; he really desires to encourage its use. Thus the delivery service. Sanders has a telephone. He advertises. Circulars, too, he distributes, and regularly. Maybe, also, he sends out letters periodically. And on all this advertising matter, including every possible container, by means of his labels, he can unroll his pet slogan that is so inviting. For him business should quickly and steadily increase. Is there not some inspiration here that would bring about like phrases for ambitious beekeepers?

You may have some particularly good feature connected with your product—its production, its packing, its distribution, its selling. Perhaps associated with one of these there is some point that should make your honey a decided favorite with people. Very well; for that reason some strong advertising slogan, that will drive home this particular good point for the escape of none, should be decided upon. Then, you can flare it wherever you wish; signs about your grounds may contain it; all your advertising matter, not overlooking your different containers.

Find out your good point, the best feature of your product. Then, by means of some descriptive slogan, get that home to every possible prospect. Let us say you do most of the gathering and bottling of your honey, even handing it over to the customer. Clean work here. No unnecessary, objectionable handling. No shifting about—everything, in fact, conducive to the utmost cleanliness. And that is what consumers of every possible food desire. But, are their desires always realized; is it always possible? No, no. But there's an opportunity here for you now. And you should make the most of it. Let your prospects know all about your honey. Therefore, for your consideration we have, "Our Honey Untouched by Hands." You might add: "From Producer to Consumer."

How about this one?—"From the Hive to the Home." Is that not the sort of slogan certain to win a reader's attention, and compel thought? Is it not a type of slogan calculated to emphasize the cleanliness associated with your product, honey, from the hive to the home of the consumer? Certainly here we have hinted a slogan that will make honey more popular; it is a slogan that will appeal to the discriminating person.

Let your prospects know that a good food can quickly be obtained from you, minus unnecessary manipulation, by means of some reminding slogan. Here's one—"Honey—Nature's Food Direct To You." This slogan, of but six words, mentions your product; it tells the prospects that it is a food of nature—very good in itself. Again, the prospect can not help but sense the element of cleanliness, and incidental cheapness, as indicated in the termination of the slogan. What beekeeper is going to use it in every possible place advisable; advertising of all sorts, announcements, etc., letters, and on the labels of containers?

The beekeeper who desires to bring home to prospects both the medicinal and food qualities of honey should not go amiss for an adequate slogan here. For instance: "Should Be on Every Table and in Every Medicine Chest." Here we have a slogan that should arouse interest in the minds of the most lethargic; in but ten words your possible buyer is given two good reasons why honey should be used.

A host of other good advertising slogans might be presented. Yet, enough have been offered to inspire the ambitious honey producer to use some distinctive group of words certain to promote his business. A strong slogan will work wonders. Through its use, people will soon think of you and your product together. Isn't that something to strive for?

Brooklyn, N. Y.

INPROVING NECTAR RESOURCES

Why Beekeepers in the United States do not Cultivate Nectar-Bearing Flowers

By Doctor E. F. Phillips

[At the Sixth International Congress of Beekeepers, held at Marseilles, France, September 18-21, 1922, one of the topics discussed was the improvement of the nectar resources. This topic was much discussed in this country 20 to 30 years ago, but many American beekeepers within comparatively recent years have discovered vast sources of nectar, formerly scarcely touched, almost at their doors. In this article, prepared for the above-mentioned congress, Doctor Phillips shows the changing American views on this subject, and points out this new source of a large supply of nectar.—Editor.]

IN a discussion of the problem of enriching the nectar-producing flora of any country consideration must be given to the extent to which the present available nectar resources are utilized, and especially the economic practicability of modifying the flora to the benefit of the beekeeper. Consideration must also be given to the subject of whether any modification of the flora will have either a beneficial or an injurious effect on persons other than beekeepers. While the experiments tried by beekeepers in the United States in this line have not been extensive, the results have been so unanimously consistent that a definite policy has for the time being been adopted, and it may be well to present a statement of the situation in the United States to explain the point of view of the American beekeeper. It is of course understood that as conditions change there may be a change in policy, and that the present decision is not necessarily final.

In the United States there are vast areas not yet adequately covered by apiaries, so that the beekeeper who wishes to increase his honey crop finds it more economical to increase the number of his colonies by establishing other apiaries than to attempt to increase the nectar resources of the region immediately surrounding apiaries already established. In almost all parts of the United States it is possible to find locations for new apiaries within a short distance, without encroaching on the territory occupied by another commercial beekeeper. In regions where there are few commercial beekeepers, the area is never fully occupied by the bees managed by those who have only a few colonies each. It is only in regions where almost all the bees are managed by commercial beekeepers that there is ever any difficulty in finding sites for additional apiaries, and even in these regions it is usually possible to do so. In most instances, therefore, the problem of increasing the honey crop is solved most easily by establishing more apiaries, without attempting to modify the flora within range of the bees. So long as there are these opportunities, the cost of honey production is decreased by the methods employed.

Influence of Good Roads.

It must also be taken into consideration that the American beekeeper who is extensively engaged in honey production is usually located where there are good roads and has an automobile truck, so that it is not much of a task to move bees from place to place in the simple type of American hives or to carry the honey and supplies from the central apiary to the various apiaries. The improvement in means of transportation has been one of the chief factors in making extensive operations in beekeeping possible in America.

The problem confronting the American beekeeper is, therefore, how he may most economically increase his crop, rather than how much nectar may be produced within range of his bees, for he must compete in the market with other beekeepers, and his profit depends largely on the cheapness with which his crop is produced.

Where the Pasture is Crowded.

In certain parts of the United States apiaries are sometimes so closely packed that there is temporary overcrowding. In the orange region of southern California, for example, colonies of bees by the thousands are brought in from the surrounding region where the sages produce nectar for the orange-blooming season. It is the usual practice to bring in the apiaries at the close of the summer, keep them in the orange region during the winter and remove them to their sage locations as soon as the orange honey flow has ceased. As a result of this practice colonies of bees are for part of the year more closely packed in this area than anywhere else in the country. In this area it would be quite impossible for the beekeeper to modify the flora in any manner, for land in this region is high in price and every available spot within the area that can be put under irrigation is planted either to citrus fruits or to some other crop of about equal productive value per acre. Since the orange tree is

capable of producing nectar per acre more abundantly than any other plant species in the United States, there is no other plant which could be used which would increase the nectar available for the bees while they are kept here. Furthermore, for reasons which will be outlined later in this paper, much of the orange nectar is lost to the bees, in spite of the fact that there is often an average of one colony to each four acres in this region during the blooming of the oranges.

The only other part of the United States where there is any problem of overstocking the region with bees is the irrigated portions of the West where the main source of nectar is alfalfa, with some sweet clover. In this instance, like the orange region, the limitation of each area is prescribed by the limits of irrigation. In parts of the alfalfa region apiaries are placed so closely that there is not room for additional colonies without overcrowding; but this condition is not characteristic of the entire alfalfa region, and throughout most of it there is room for many more colonies of bees. In all other parts of the United States, except portions that produce no nectar at all because of their desert condition, there is room for 10 times as many colonies of bees as are now kept. In the irrigated regions, both that part where oranges are grown and the part where alfalfa is the chief nectar source, the land is entirely too valuable for the beekeeper to grow any plant for the nectar alone.

Cultivating Nectar-Bearing Plants.

For many years beekeepers of the United States tried experiments in the growing of nectar-producing plants with a view to improving their condition. In all cases in which careful records were kept, it was found that the cost of planting and cultivation far exceeded the value of the nectar, and for years it has been known to the beekeepers of this country that it does not pay to cultivate any plant for nectar alone. The experiments in this line were chiefly tried at a time when the cost of labor was lower than at present and when land values were much lower than at present, so that there can be no doubt, with the present high prices for labor and for land, any modification of the nectar resources would be made at a loss, provided the plants demand any care or cultivation whatsoever.

The most extensive experiments in this line were instituted in 1905 by the United States Bureau of Entomology, under a former administration of the Bureau work in beekeeping. Seeds of a considerable number of nectar-producing plants were sent to prominent beekeepers in all parts of the United States with directions for planting and caring for the plants. They were asked to report the results, and many did so. Several beekeepers reported that their bees worked vigorously on the plants when in bloom, but in not a single case did the beekeeper consider it worth while to continue to grow the plants. This indicates better than anything else that they did not find it actually profitable. The plants chosen in these trials were to a considerable degree those which had been and are being used by European beekeepers for the same purpose. Many of the species were already introduced in the United States and are growing wild. All of them are at some place in the world recognized as valuable for nectar, but none of them were profitably grown by the many beekeepers who made the trials at the request of the Bureau.

It is interesting to Americans to note that certain European beekeepers advise the planting of *Phacelia tanacetifolia*, which is native to California and which there constitutes merely one of the minor nectar sources. This species has been grown in various parts of the United States, but never at a profit to the beekeeper. In California, where it is native, no beekeeper ever considers increasing the number of plants for his bees.

If cultivation is impracticable, there remains the possibility of improving the flora by the scattering of seeds of nectar-secreting plants in waste places, in cases where the nectar-secreting plants will supplant other weeds, and where they will reseed themselves and crowd out other plants either native or introduced to the advantage of the beekeeper. In these instances, the beekeeper should exercise care that the plants sown are not ones which will constitute a serious weed pest, for the scattering of such seed is against the law in most states.

Scattering Sweet Clover Seed in Waste Places.

Many experiments of this kind have been tried by American beekeepers, and the only plant species which has been profitable in this way is white sweet clover (*Melilotus alba*). Beekeepers in all parts of the country have scattered seed of this species widely and in some instances they have probably been benefited by so doing, but in no case has the result come up to expectations. This species grows on almost all types of soil and in many kinds of locations, but it secretes nectar well only on soils that are rich in lime. In all thickly settled parts of the United States weeds and other plants along roadsides and railroads are cut each summer to prevent reseeding and to improve the appearance of the region; and for this reason the sowing of sweet clover on waste land has

usually not been especially valuable, even though it is impossible to eradicate it by the means usually employed.

There has been much excitement in beekeeping circles in the United States recently about the annual variety of sweet clover. This variety may prove as beneficial as the biennial sweet clover for sowing in waste places, but will scarcely prove any more beneficial. Doubtless within the next few years seed of this variety will be widely scattered throughout the country by beekeepers.

A considerable portion of the commercial honey crop of the United States comes from plants which have an economic value other than for nectar secretion. The chief plants of this kind are buckwheat, alfalfa, alsike clover, sweet clover and cotton. These plants can not be grown in all parts of the United States because of the great diversity of climatic and soil conditions. Wherever any such farm crop can be grown with profit without regard to the nectar which the flowers produce, there the beekeeper sometimes finds it profitable to encourage the planting of the crop from which he gets nectar. In some cases beekeepers have found it advantageous to supply seed of some of these plants to their neighbors for a year or two, but unless the crop can be grown profitably when the farmer buys the seed, the distribution of such seed will have no lasting benefit on the nectar resources of the region.

Beekeeping and Fruit-Growing.

Because of the benefit derived from the ability of the honeybee to carry pollen from flower to flower, bringing about cross-pollination, the keeping of bees in certain areas, such as large fruit-growing areas, has been encouraged. The profit in this way added to agriculture induces the farmers to encourage beekeeping by their neighbors, or to keep some bees themselves. Because of the specialized nature of the beekeeper's work, most fruit growers find it better to have a specialist beekeeper bring in colonies of bees rather than to attempt to learn beekeeping themselves, and for the use of the bees, fruit-growers are often willing to pay a good price. Even where the benefits of bees in cross-pollination are fully realized, it has never been found practicable to plant anything for the use of the bees during parts of the year when there is no nectar available from the fruit trees. In parts of the country fruit trees are so solidly planted that there is too little for the bees after fruit bloom has passed. Under these conditions the most profitable thing is to move the bees away by automobile truck to a more favorable place for the remainder of the summer.

A few enthusiastic amateur beekeepers have found pleasure in growing a number of plant species for the benefit of their bees, and, for persons who have the necessary means at their disposal to permit such recreation and who are not attempting to keep bees for profit, this effort affords great pleasure. There is, however, under the conditions prevailing in the United States no financial profit in it. When a beekeeper desires to make observations on the way the bees work on the several species of plants, or desires to make some other such observations, the planting of seed and the cultivation of the plants are worth while; but where the beekeeper desires to keep bees for the profit to be derived from their care, this is impossible.

While Nature is free with her supply of sweets in the flowers, it is impossible under conditions as they exist in the United States for a beekeeper to grow enough plants to supply even the bees in a small apiary, and in a country where beekeepers sometimes number their colonies by the thousands, it would be necessary to grow many acres of plants to make any appreciable difference to the bees.

Increasing the Crop by Better Management.

There is another even more serious consideration. Most beekeepers of the United States fail to get their bees strong in time for the full gathering of nectar at the beginning of nectar secretion of the most important honey plants, and as a result of this failure their honey crops are often reduced one-half. This loss is directly to be attributed to poor beekeeping. Since this trouble exists in all parts of the country and with beekeepers of all classes, it would seem that the most important step to be taken is the education of beekeepers in better methods of management to permit them to utilize the nectar resources now at hand. To attempt to increase the supply of nectar while vast stores are ungathered because of poor beekeeping would be an extravagant waste of effort, not at all in keeping with American ideals.

It is obvious from a reading of the literature on beekeeping in all parts of the world, as well as from a study of the activities of the bees themselves, that the most serious problem confronting beekeepers everywhere is that of getting the bees strong in time for the beginning of the nectar flow. Under normal conditions without the intervention of the beekeeper, the egg-laying of the queen will be increased with the incoming of nectar. This has been found to be true in all parts of the world where bees are kept. It follows, if an increase in brood-rearing

(Continued on page 759.)

FROM THE FIELD OF EXPERIENCE

CARRYING BEES INTO CELLAR

Importance of Putting Colonies into Their Winter Quarters Quietly

After the season's work with the bees is over, so far as securing and taking care of the crop and seeing that all colonies have been carefully inspected, headed with choice young queens and have an abundance of the very best stores are concerned, the question arises as to just when and how we shall put them away for winter. Of course, while those who winter outside have plenty of time to do this work, the wise beekeeper sees to it that sufficient good, dry packing material has been provided and that the bees are packed as soon as possible after they are fed up for their long winter nap. On the other hand, we who winter in cellars do not care to put them away until they have had their last possible cleansing flight. I will tell briefly how and when we put ours away.

In our 19 years of cellaring we have found that, in our section of the Thumb district of Michigan, there have been but two or three times that the bees could have had another good flight after the 20th of November. In several cases it has been warm enough for them to fly from a day or two before the 20th until as much as a week after that time. We have decided that the 20th is a good time for us to put them away; but, as we want a cold day and night for the work, we wait until it turns cold following the 20th even though they have not had a good flight for some time. We want them put away as quietly as possible, and that is why we choose a cold day.

Early in the morning we open all entrances to the full width of the hives and about 1¼ inches deep. We do this by using two wedges of the same length as the hives and slip one in each side between the bottom board and side wall of the hive. Use lots of smoke when doing this. Many beekeepers think that because the colonies are clustered and the day is cold that they can dispense with smoke. The fact is that many colonies will be greatly disturbed if plenty of smoke is not used and will not get settled down properly again by night. A few such colonies taken into the cellar soon start an uproar that is not easily caused to subside, and in no way helps the successful wintering of the bees. Smoke is cheap and it doesn't take long to administer plenty of it if you have a good smoker well filled with good fuel. Opening the entrances in this way causes the bees to cluster up very closely to keep warm, and getting it done in the morning gives them plenty of time to quiet down properly so that they will not rouse up easily when being carried in at night. We always carry in at night. They handle better and are less apt to be disturbed. We have the cellar well aired out by leaving the doors and ventilators open for several days before putting the bees in.

We begin putting them in as soon as we can get enough help together in the evening, which is usually about 7 o'clock. With several hundred colonies to put away, we plan on eight men to do the work. We use three carriers, two men to the carrier, and have one man to lift the colonies on the carriers (a careful man is chosen for this work), and one man to pile them up in the cellar (a good place for another careful man). Two colonies are carried at a time on each carrier. All men are instructed to be very careful not to jar the bees more than absolutely necessary. We use two smokers with a good fire and plenty of smoke in each, and have a lamp in the cellar turned just high enough so that we can see to get around. The cellar is kept well filled with smoke all the while that the bees are being put in. The more smoke the better, just so long as the men can stand it. All hives are piled facing the wall or away from the entrance and light. We pile them up five high, with the hives touching each other side by side the full length or width of cellar, leaving room to get around at either end or side. We also leave an alley between each row of hives. This gives a better chance for the air to circulate and allows for one to get around among them during the winter if occasion requires.

The man in the yard uses lots of smoke in the entrances before loading. The hives are set carefully on the carriers, carried in as quietly as possible and as carefully piled away. After they are all in, the cellar is left with all ventilators open to let the smoke out and to let the cellar cool down as quickly as possible. Doors are closed and ventilators adjusted in the morning when all is quiet. The bees are then off on their long sleep, and Mr. Beekeeper is all ready for his long wait for springtime and another summer with the bees.

I do not know that it matters so much whether the bees are put away at

night or during the daytime. The great thing, as I see it, is that they are put away quietly. We think we can do that better at night. We want plenty of help to put them away quickly so that, in case any colonies have been disturbed, they will quiet down at once. About 125 to 150 colonies per hour is the capacity of the crew mentioned above.

Filion, Mich. David Running.

STORES AND PROTECTION

Scientific Tests of Different Kinds of Winter Stores and Winter Protection

A college thesis is usually done with infinite care. Of all the work a student does, it is the work in which he takes most pride. The subject chosen is one in which he is interested. There is competent supervision available. The government furnishes the materials to work with. And the student, although he usually doesn't think so, has plenty of time.

One of the fourth-year theses taken at the Ontario Agricultural College, Guelph, Ontario, was for the purpose of finding out the comparative value of sugar syrup, clover honey and buckwheat honey as winter feed for bees.

Early in October, 12 colonies as nearly alike as possible were chosen for the experiment. Four colonies were fed sugar syrup, four clover honey and four buckwheat honey. Each was given 40 pounds. The honey was fed in combs, while the syrup was fed from feeders. Plenty of pollen was left in each hive.

The winter of 1922-23 was both steadier and colder than either of the two previous winters. A few bees flew on December 1, but not again until March 4. In other words they were confined to their hives for over three months. The results of the experiment were as follows:

Although the combs of buckwheat honey were three-quarters sealed, all of the colonies fed buckwheat showed signs of dysentery and were either weak or dead.

There was less clover honey consumed per pound of bees than was the case with either of the other feeds. Sugar syrup was used in largest quantities. The figures show that 4.09 pounds of sugar syrup, 3.10 pounds of clover honey and 3.68 pounds of buckwheat honey were consumed per pound of bees, fall weight.

Of the bees fed on clover honey, 38.8% survived the winter; of those fed on sugar syrup, 25%; and of those fed on buckwheat honey, 17.7% lived over.

Another thesis, worked in conjunction with the above, was to ascertain the value of winter protection. The same 12 colonies were used for both. Six of these were placed in the apiary behind a dense spruce windbreak, and six were placed in a wind swept location. Of the six in each location, three were packed and three were left unpacked.

The results are very interesting. There were 5% more bees wintered over in the sheltered than in the unsheltered location. Comparing the fall with the spring weights, there were 25% more bees wintered over in the packed than in the unpacked colonies. But this 25% difference was the cause of life or death—death in the case of four colonies.

These results, it is hoped, will help to establish the comparative value of three of the best feeds and also the value of packing and a good windbreak. Clover honey, if cost is left out of consideration, seems to be the very best feed. Packing seems to be of much more importance than a windbreak.

The colony that was strongest in the early spring, it was noted, had most brood in the late fall, was well protected by packing and windbreak, and fed on clover honey.

Some one has said, "It is dysentery that kills our bees." Yes, he is right. Purity of feed and amount of protection are the factors which here in the North control dysentery. A. A. Werner.

Manticoke, Ont., Can.

WHY PLANTS GIVE OFF NECTAR

Also Why Sap is Rich in Sugar Content when Nights are Cool

In my capacity as beekeeper, the nature and importance of nectaries to plant life have often been in my mind, so perhaps the following thoughts on the subject might interest other beekeepers, and perhaps induce others to let us have their deliberations also.

In my opinion, the nectaries may perhaps be considered primarily as regulators of the sugar contents of the sap rising through the pistil to the stigma. Secondarily, they assist to bring about cross-fertilization.

I quote from "Nature and Development of Plants," by C. C. Curtis, Professor of Botany in Columbia University: "The stigma is admirably adapted to hold the microspores, being provided with minute outgrowths, and frequently sugary solutions are exuded which fasten the spores to the stigma. The real importance of these sugary solutions is to nourish the microspores. It is evident that these minute dustlike cells can not contain sufficient food to bring about any considerable growth. It is noteworthy that the strength and nature of the sugar solutions vary in different stig-

mas, and that the microspores are often able to grow only in solutions of such strength or in the presence of such substances as are found on the stigmas of their own kind of plant. So it results that the microspores are often unable to grow when carried to the stigmas of a different kind of plant from themselves."

This capacity as regulators, of course, the nectaries will fulfill equally well, whether they be floral or extra-floral.

The sugar-contents of the cell sap in the plant vary, acting very likely as a regulator as regards temperature, etc. It is well known that in northern climates, when frost sets in, and ice crystals begin to form inside the plant, and which crystals will commence to form, not inside the cells, but between the cell walls, drawing the water from the cells, whereby the salts in the cells would become so strong that they would destroy the albumen of the nucleus, that the plant defends its life by transforming its stores of starch into sugar which protects the albumen.

I believe that this transformation of starch into sugar, for protective purposes, takes place ordinarily during cold nights, so that the mornings following cold nights will find a cell sap rich in sugar, the plant ridding itself of the surplus, which would be detrimental to the functioning of the flowers, through the nectaries. Hence heavy nectar-secretion after a cold night. Axel Holst.

St. Thomas, Virgin Islands.

SODIUM HYPOCHLORITE

How This Can be Made by Beekeepers who Have the Necessary Time and Inclination

[The following article, by J. Roy Lincoln, was sent in by H. M. Myers, Ransomville, N. Y., in response to the flood of inquiries which he and Mr. Lincoln are unable to answer personally. These inquiries are a result of the mention, on page 607, September issue, of Mr. Lincoln's paper read at the Western New York Beekeepers' Association meeting. No doubt, most beekeepers who desire to try this disinfectant will prefer to purchase a specially prepared solution, but Mr. Lincoln tells how ordinary sodium hypochlorite can be made.—Editor.]

While the use of disinfectants for curing foul brood is receiving considerable attention from beekeepers, it has not been definitely demonstrated that sodium hypochlorite is the most desirable agent for the sterilization of combs in which brood has died, especially if they have capped cells in which brood has died. Still it may be useful about the honey-house in cleaning tools and washing spilled or smeared honey, thus preventing the spread of the disease.

The chemicals necessary for manufacture are sodium hydroxide and chlorine gas. The addition of about 2½% anhydrous sodium carbonate to the caustic before chlorinating not only renders the resultant hypochlorite solution more stable but the chlorine used is made 100% available for disinfecting. It will not be necessary to store it in amber-colored bottles, and hot weather will not render the solution useless.

For making 10 gallons of solution, weigh 10 pounds of caustic soda (60% caustic ash) and 2½ pounds anhydrous sodium carbonate and dissolve in one-third to one-half the water in an iron kettle. Pour into a larger receptacle to receive the chlorine gas, add the balance of the water and allow to cool. The chlorine must be passed very slowly into the solution through a delivery tube passing nearly to the bottom of the solution, and the gas made to discharge through small openings not more than one-sixteenth of an inch in diameter. Every joint between the chlorine drum and the discharge must be tight, and the flow of chlorine regulated with a needle valve. The manufacturers or the agents from whom the chlorine is purchased will be glad to give directions as to how to fit up a chlorinating tank. It would be well, too, if the beekeeper, when setting up his outfit for the first time, have the work supervised by some one having a knowledge of chemistry and the nature of chlorine gas. After the beekeeper has made his first batch of hypochlorite, the work will afterwards be easy; but he should see that everything is right at the start.

While the chlorine is being discharged into the solution, the drum should stand on a scale and the weight accurately determined before turning on the gas. Then the weights should be set back an amount equal to the weight of gas we want discharged into the caustic solution. In making 10 gallons of solution, set it back just 4½ pounds and stop the flow of gas just as soon as the beam rises. Your hypochlorite will now be finished, and have just a little more than 4½% available chlorine. It is best stored in glass bottles or carboys, but can be kept some time in wooden barrels.

Now, as to the cost. Drum chlorine costs from seven cents to ten cents per pound. Caustic soda (60% caustic ash) costs about four cents, and anhydrous sodium carbonate about two cents per pound. Figure up what your 10 gallons has cost you per gallon for raw material. If he can purchase it already reliably manufactured at a reasonable cost, it

will not pay the beekeeper to attempt work so far out of his line. But when the market price ranges from 40 cents per gallon for an 8% solution to $3.00 for a 4% solution, it is well for the beekeeper to inquire how he can obtain the product most economically. If the manufacturer's price is reasonable, it is best to buy the hypochlorite. It might be best for several beekeepers in a locality afflicted with American foul brood to club together and have a large quantity made up, as the ingredients are so cheap and it is not always convenient to purchase them in small quantities.

J. Roy Lincoln.

Niagara Falls, N. Y.

SUCCESS IN SPITE OF DISEASE

How Enthusiasm and Perseverance Win Even in the Midst of American Foul Brood

American foul brood to the right of us, American foul brood to the left of us, American foul brood in the midst of us! Glorious inspiration, isn't it?

Three years with bees! Three years of sorrow, of foul brood, of experience with neighbors who close their ears to modern methods, three years of profound thought and study, but for all of that three years of JOY spelled with capital letters!

I am a rural mail carrier, whose first acquaintance with bees came when I pulled up to a mail box and found a large swarm covering the box. Today I would have played a joke on the patron (who, by the way, was afraid of bees, and these were a stray swarm), by putting his mail in the box, but on that day he received special service as I delivered his mail at the door.

Two years later, on a zero day I bought the bees of a patron who was leaving the country. I did no more than lift them and see that they were in modern hives.

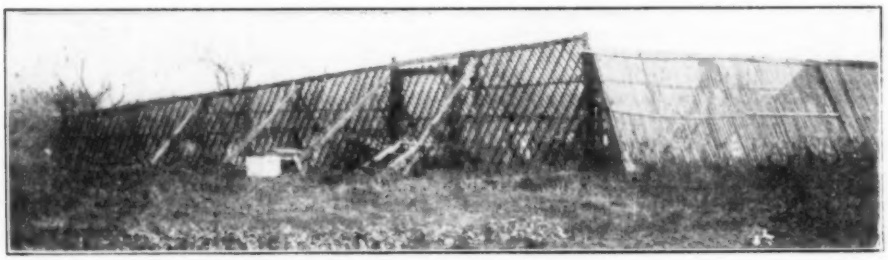
Modern hives? Yes, the hives had movable frames, that is, at one time but not then, for the combs were built crosswise of the hive. You can imagine the fun I had transferring. In those days I was so ignorant of bees and beedom that, in the spring when my neighbors' big black bees started to rob and overpower mine, I actually thought it was the workers killing the drones. That I had my colonies left was due only to Providence.

In August, I discovered that I had American foul brood for which I treated. The colonies went into winter quarters without a cell showing signs of the disease. This showed to me the falsity of my neighbors' reasonings regarding their bees dying the second year after being hived, which they attributed to the spraying of fruit bloom. As swarming takes place after the spraying season, the swarms, or rather the new colonies, having no access to poisoned honey or pollen, as they called it, carried none into their new home. The next spring at the time of fruit bloom they would load up their hive with this so-called poison. During the summer and winter the poison would get in its work!

I procured the state inspector for a day, and together we made the rounds of the town and surrounding territory, making a few converts, whom I later assisted in cleaning up their colonies. But those nearest to me pretended to be converts until after the inspector was gone, and then refused to budge. These were surely days of sorrow. Many are the hours in which I seriously debated giving up bees, but the love for the little insects won. This is a good place to add that every year I have to treat this dread disease.

The first year, my best colony produced $12.00 worth of surplus honey; the second year, $32.00; while last year my best colony produced surplus to the amount of $60, and from the colony I took a one-frame nucleus which built up to a strong colony for winter. My average production per colony, spring count, for 1922 was $27.30. Lloyd H. Dickman.

Sumner, Iowa.



Mr. J. F. Dunn, Ridgeway, Ontario, believes in adequate protection of the apiary against wind. This apiary is on stony ground where upright posts can not be set to hold the fence. The open lattice construction greatly reduces the wind pressure against the fence and prevents the wind from swooping down over the hives as it does when a tight fence is built.

ADVICE ON WINTERING

Some of the Details that Need Attention for Good Wintering

"How doth the busy bee," through the coming bee-vacation months depends in very large measure on the condition of her winter quarters.

In the Southland the matter of wintering the honey gatherers is not a difficult one, but in a climate where the retiring habits of the mercury are as pronounced as they are in northern Wisconsin the question of how to provide comfortable winter apartments for these little summer people is some problem.

The old way of carrying the hive into the cellar on the approach of snowflakes is the simplest and most economical one from the standpoint of labor and supplies; but the outdoor method of wintering is gaining favor with beekeepers, because it brings the colony through in healthier condition.

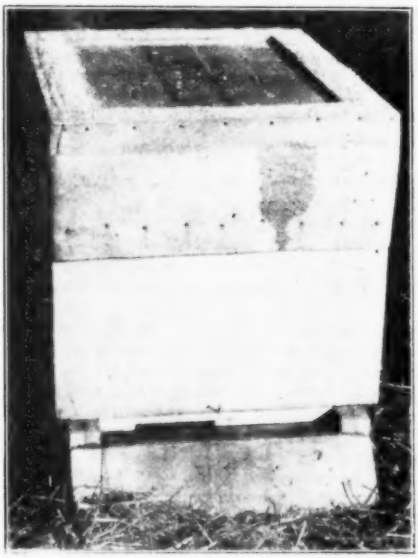
Protection, of course, there must be in cold weather, if out of doors, and in proportion to the severity of the climate. If the hive is not made with double walls to admit of packing, outside cases or covers should be put over the hive and the intervening space packed with chaff, leaves, shavings, excelsior or similar dry material.

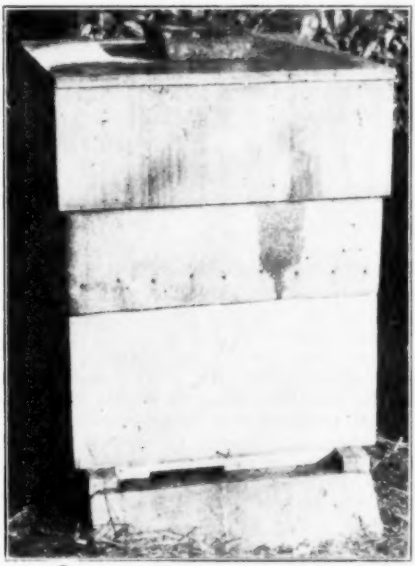
The lower the temperature inside the hive, the more honey must be consumed by the colony to keep up their vitality.

A very important preliminary, however, is to have the colony in good condition when put into storage. A good, strong colony of young bees, a queen of vitality, and plenty of honey for the winter's food are essential to best results.

From 25 to 40 pounds of honey, depending on the length of confinement and the severity of the weather, is necessary to put the sweet harvesters through in good shape. Good, pure honey or a syrup made of best granulated sugar and water should be fed in cases of insufficient stores in the hive. Do not use molasses or a cheap grade of sugar for the syrup. Put into cold water as much sugar as it will hold in solution. If honey is fed, dilute it somewhat. For feeding, fill a shallow tin dish with excelsior, pour the syrup into the dish and set on top of the frames inside the super. [For feeding as late as October or November, the syrup should be made quite thick, not less than two parts of sugar to one part of water. To make such heavy syrup the water should be heated to the boiling point. For feeding in cool weather, the friction-top pail feeder is usually preferred.—Editor.]

Another element besides cold to be guarded against is dampness, the latter being even more fatal to bees in storage than the former. A mat of some ab-





Food chamber on Buckeye hive packed for winter. Geo. J. Griesenauer, Chicago, Ill., has devised this method for packing the food chamber when used in connection with the double-walled hive. The jacket is made of tarred paper tacked to a light framework. The cut at the left shows the inner cover on top of the food chamber. Packing material is poured in between the food chamber and the outer jacket, then the chaff tray is placed on top and finally the cover put in place as shown at the right.

sorbent fabric laid on top of the frames in the hive serves to gather excess moisture from the atmosphere, while care should be taken to make the entrance hole close to the floor so that possible condensed moisture may run out.

When bees are wintered outside, the entrance should be reduced enough to keep out mice and cold draughts but not enough to prevent the passage of the bees when the weather permits. All needed preparations for the colony's comfort should be made before cold weather, that it may not be necessary to expose the bees by opening the hive later.

Neither is a damp cellar a good place to winter bees. A dry cellar with a temperature of from 40 to 45 degrees Fahrenheit, well ventilated but dark, should be selected. This inside housing does not give the bees the opportunity of flight until spring; but, as they will consume less stores in their warmer retreat, they can survive a longer period without evacuation of intestines, which in a normal state never takes place inside the hive.

A coarse wire cloth, no finer than is necessary to keep out mice, should cover the entrance of the hive. In case the bees become restless from too high temperature, open the cellar at night sufficiently to reduce the temperature, but do not admit light. As weak colonies can not be depended upon to winter safely, it is best to unite two or more before putting them in. Smoke them well to overcome their irritability toward one another. Preserve the strongest queen.

In the spring the old bees will die off. A good brood of young bees, when put into winter quarters in the fall, will make good this spring loss. If, however, the colony has not wintered well, it should be kept warm and fed if necessary, that new brood may the sooner be reared to take the place of the old bees.

Josephine E. Tool.

New Richmond, Wis.

HEATING AND BOTTLING HONEY

How to Prevent Froth on Top of Honey in the Bottles

There is no doubt that heating honey injures its flavor more or less, and to the honey lover there can be no comparison between honey before and after heating. There is an aroma about nice, ripe honey straight from the extractor which is easily lost; and it is much better (if there is any chance of a fast enough sale to allow it) to bottle the new honey without heating it at all. This is, of course, a slower process than bottling it hot, but it is not so slow on a hot day, say, with the thermometer up in the nineties. Even on a moderately warm day the honey will run fairly well. This would do for the average beekeeper; but, of course, for trade bottling it is necessary to heat the honey.

Summer arrangement of the apiary of C. E. Kindschi's apiary in Madison, Wisconsin. The hives are arranged in pairs since they are packed for winter in cases holding two colonies each as shown on the next page.

Allowing the honey to run away out of the 60-pound can as fast as it is melted is a good plan; but care should be taken that the solid block of candied honey does not slip down, plug the opening, and by this means imprison the honey already melted.

Bubbles and scum on top of the honey are always a trouble but are more prevalent with some kinds of honey than others. If honey is well ripened and dense, there is usually not much trouble with scum or froth. For many years I bottled honey in large quantities until my apiaries became too numerous to allow me to oversee the business. I never used the goose-neck filler, as illustrated in Gleanings last year, although no doubt it is a good thing; but the fillers had a knack of allowing the stream of hot honey to run against the neck of the bottle or jar in such a way that there was no scum.

I do not know that the goose neck would be faster than my plan. I do not see much merit in the fact that the jar

or bottle does not have to be moved when the goose-neck filler is used, because it has to be moved anyway for further manipulation. The fillers become very expert and can lift a bottle or jar out of a container alongside, fill it, and pass it along the bench very quickly. It is then taken by a second person, and a parchment or tin top put on, or, if a bottle, a cork put in the neck. Then a capsule or wax top is put on, and finally the label.

All this is done at top speed, and the bottle never leaves the bench until it is ready for the customer. The bottles and jars were packed in boxes, and, as most of my business was direct to the Sydney shops, the boxes had no tops. They were emptied at once and brought back.

Sydney is a city of something over a million inhabitants, and its honey consumption is increasing because the beekeepers are starting seriously to educate the people up to the fact that honey is a good food.

A. S. Shallard.

South Woodburn, Sydney, N. S. W.

HONEY SOURCES OF KOOTENAY

Fireweed and Milkweed Important Honey Plants of this Region

In the Kootenay district of British Columbia, the beekeeping industry is beginning to be appreciated as a very useful one. Here during the latter part of the season the bees depend largely upon the fireweed and milkweed for their honey supply.

The fireweed, or willow-herb, belongs to the evening primrose family (order *Onagraceae*). Different varieties of this plant are known in these mountains; the fireweed (*Chamaenerion angustifolium*), well known all over the country wherever fire has destroyed all other vegetation; the broad-leaved willow-herb (*C. Latifolium*), also bearing pinky purple blossoms in racemes, but mainly in short leafy bracted racemes; the yellow willow-herb (*Epilobium lutem*), with small pale-yellow flowers nodding in the axils of the leaves, a rare plant found along the Alpine brooks of the Selkirks; the Alpine willow-herb (*E. alpinum*), found higher up the mountains, with its few white flowers nearly erect; and the nodding willow-herb (*E. anagallidifolium*), a low tufted plant with a few pinky purple flowers nodding in a cluster at the apex.

Next to the fireweed, the milkweed is the favorite, not the true milkweed (*Asclepiadaceae*), whose rose-colored flowers with their complicated mechanism seem specially fitted for the long tongues of the Monarch butterflies, but the dogbane (*Apocynum*), a low spreading plant with a milky acrid juice, a tough inner bark, and generally with the entire, opposite occurring leaves. The flowers are regular and the five-lobed corolla or flower cup is convolute in the bud, i. e., one edge is in and one out. The five stamens are alternate with the lobes of the corolla. The fruit is in two separate pods, which split when ripe and set free many tiny seeds, with short tufts of down at one end, giving them a dart-shaped appearance.

The flowers, which occur in loose cymes, easily attract the flower lover as well as the honeybee. The dainty shell pink bells, with lobes turned back, suggest a wealth of hidden sweetness in their depths. In some places, indeed, the plant

Winter appearance of the apiary shown on the previous page. Each winter case is built to hold two colonies.

is known as honey-bloom, certainly a name more suited than others that have been given it.

There are many other honey plants throughout the year in this most favored honey-yielding area. But the Doukhobours, who live in communities here and there, have introduced one plant that must have associated with it some interesting story peculiar to these strange people. Each garden where bees are kept, has its patch of mignonette (*Resedaceae*). Here in late summer, as evening approaches and the dews come laden with the sweet reminiscent odor of these inconspicuous flowers, a happy buzzing associates itself with the sweet odors, and the traveler is aware that the bees are keeping "blind man's holiday," before resting from their labors.

Mrs. W. Garland Foster.

Nelson, B. C., Canada.

DEEPER BROOD-CHAMBERS

How They May be Tried Out at Little Expense

For some time now I have been convinced that the standard 9½-inch-depth hive-body in general use is too shallow for a brood-chamber, that is, too shallow for the system of beekeeping that I am compelled to adopt as my apiaries are all outyards. After careful observation of bees kept in hives on the deeper frames,

the results showed a marked difference in their favor. I have always tried to keep swarming down to a minimum, using the Demaree plan modified more or less to suit the weather and other conditions, but I can't say that I am altogether satisfied with the results. I have no criticism to offer on the plan, for as long as we persist in keeping bees in a hive of that depth some such manipulation will be necessary if we control swarming—and there is no question as to the advisability of eliminating swarming.

I never could quite bring myself to the point of believing that it did not do much harm to turn everything upside down and demoralize the whole routine of the colony as it does to scatter the brood-frames, putting the most of them above an excluder and replacing with foundation or empty combs. Here in San Diego County, especially along the coast, the bees build up early in the season and start to swarm sometimes as early as February. Now the weather has not by any means settled so early and sometimes does not until in May, so there are cool rainy days and nights long after swarming is under way and some years pretty well over—that is, where the bees were properly wintered and had plenty of honey left in the hives to back them up during the unfavorable days of early spring. To scatter the brood before it is warm enough will work far more injury than to let them alone. However, we cannot control swarming by letting them alone; so evidently this system, under these conditions at any rate, leaves much to be desired. Manipulating bees early in the season during unfavorable weather results in the loss of queens more or less, as the bees have a tendency to ball and kill the queen when disturbed to any extent; and the loss of a queen is a disaster to the colony, especially at this time of the year. After a careful study of the situation the only logical conclusion to me was more room for the queen and leaving her alone until the days are warm enough. When I say more room for the queen, I mean more room in the brood-chamber where she belongs. I always winter the bees in a two-story hive. Sometimes the queen passes from one story to the other and back, but one can't depend on her going back; so putting on supers does not help to any extent without some other manipulation. Another thing I noticed was that, with the deeper frames, excluders were not so necessary.

Having all the smaller frames and the equipment to go with them, the next question was, would it pay to change over to the deep frame or should I peg along in the old established line as in the past? If the old stuff had to be junked, it most certainly would not pay to change. If I had to have special brood-chambers made or tops and bottoms made, I did not think it would pay, so I set about to find some way to convert my 9½-inch hives into deeper ones and still be able, with little expense, to change back to the original-depth body, if I wished.

I put two hive-bodies together, one on top of the other, and made a frame to fit, but that was too much—entirely out of the question; so, having a lot of comb-honey supers, I nailed one under a hive-body and made a frame for it. This made a little deeper brood-chamber than I wanted, but it was the best I could figure out and use the regular stuff; so I went ahead at that. Since then, however, I have been convinced that it is about the right depth. It makes a frame 12½ inches deep in the clear. I used the top-bar from the regular Hoffman frame, also the bottom-bar. The only expense was cutting out a longer end piece and punching them for wires. The end-pieces were punched for six wires, two of which were close to the top. I used No. 28 wire

With this arrangement all of the old standard frames and supers may be used for extracting, and I consider them ideal for that purpose, being just the right size to handle. Anything larger would be too large for me at any rate, and anything smaller would make too many to handle for the amount of honey. The same tops and bottoms may be used also, and that was the main reason why I went deeper rather than sideways. Nine frames in this brood-chamber, thus spacing them 1½-inch centers, give nearly the same comb space as the Dadant hive which requires 11 frames, hence being a wider hive. By using the regular ten-frame spacing it gives us a frame more, and I am inclined to think that that is enough for most queens. In time I may have new brood-chambers made, but for a while I will use only equipment on hand or of the same size. Having plenty of comb-honey supers on hand it is a very easy matter to fit up a hive on short notice, and, if this depth does not work out to suit my needs, everything but the combs can be used as originally intended without extra expense. Of course, such a hive would not be much for migratory work, but that does not worry me. In years gone by I have worn out myself and rolling stock dragging bees over these hills and vales, chasing a honey flow that shut off about as soon as I got there and set up for the big show. That is all over now. I hope I will never have to nail another screen over a beehive.

El Cajon, Calif. Geo. B. Dickerson.

SIFTINGS

J. E. Crane

MOST excellent are the directions for feeding and preparing bees for winter, in the October number of Gleanings, which so nearly harmonize with our experience during the past 50 or more years. We have found almost exactly the same as given by M. J. Deyell on page 661. We have had little trouble with granulation until last year when we were compelled to use tartaric acid.

* * *

That was surely a great meeting at Madison as well as the one at Marengo, and we regret our inability to attend them, while we congratulate those who were able to do so. How true it is that "The fellowship of kindred minds is like to that above."

* * *

The methods of judging the amount of feed to be given each hive by "hefting" or even by weighing, as given by Wallace Park on page 662, seem to me a little imperfect, as there is a great difference in the weight of combs. Old combs often weigh twice that of new combs. And, again, the wood of one hive may be much heavier than that of another. This is quite true of large double-walled hives.

* * *

Among the many interesting hints on preparing and selling honey, Miss Josephine Morse says the "Labels are plain black and white, *easy to-read lettering.*" The italics are my own. Some beekeepers put up their honey with labels of fancy lettering quite difficult to read. The larger the word *honey* can be printed, the better. It suits me to have it large enough to extend across the side of a 4¼ x 4¼ section, so as to be easily seen and read across or from one end of a store to the other.

* * *

A good deal is said in the October number of Gleanings on the subject of increasing the demand for honey, and the necessity of stimulating this demand is very evident on every hand. Now, it is well to talk and discuss this subject, but better to do something that will amount to something. I read with keen pleasure Mr. Willson's paragraph on page 680 on the "Empire State Honey Marketing Co-operative Association." If the name is not too long and unwieldly for it to carry, I should say it is a move in the right direction, and hope it will meet with great success.

It hardly needed Mr. Hahman's interesting article on page 671 to prove the value of a food chamber. While we have not been wholly satisfied with their use on a hive during the winter, we shall lay in a good supply of them for use in early spring as soon as brood-rearing becomes strong. I believe we shall get better results than to keep them on the hives all winter. We shall also lay in a much larger stock of heavy brood-combs to exchange with various colonies for light combs in the spring, and in this way get all the advantages of the food chamber with the disadvantage of a little extra labor.

* * *

We have made it a rule for many years to open each hive and see just how full of honey the combs are before we decide on the amount of syrup to be fed. Even this method is not perfect, as many combs that appear full of honey may contain a large amount of beebread covered with honey, and so deceive us. Lifting one or two combs will often reveal the amount of honey, and besides we have a chance to measure the strength of the colony. If lacking in numbers we can shove the bees up with a division-board, when they will take down the syrup better, store it more compactly and reduce it to the proper consistency quicker.

* * *

I am just back from the Brockton Fair, held each year in Brockton, Mass. It is one of the largest, if not the largest fair, held in New England. One large building was devoted to food products, and I found there one small stall given up to the exhibition and sale of honey; but it was very small compared with what it should have been.

The exhibit of honey in the horticultural hall was very creditable, although it did not very well represent the white clover honey from Vermont. The larger portion was amber or dark honey in glass. Electric lights back of the shelves added much to the attractiveness of the display.

On the train I met a man who told me the old story of artificial combs filled with glucose. Say what I could, I could not convince him that it is not so. He knew better, for the papers had told all about it within two or three years. And the worst of it was I found out he is a Vermonter.

FROM NORTH, EAST, WEST AND SOUTH

In Southern California.—"Fair Time" is on, and the Riverside County Beekeepers' Club is making arrangements to place an exhibit at the Southern California District Fair to be held in Riverside, October 9-13. For many years this club has placed an exhibit at this fair that would be a credit to any state fair. This has been possible mainly through the untiring efforts of the president of the club. R. Powell. One man, of course, can not do everything toward making a success of these displays, and it is only by the support that he gets from the beekeepers that he is able to obtain the material necessary to represent properly the industry.

If every beekeeper will just do his bit and see that there is an exhibit at each fair, it will go a long way toward advertising honey and keeping it continually before the American people. It is only in such ways that we can hope to keep the demand for honey active enough so that we can sell and get a fair price for our product.

Something of an innovation has been started, and is meeting with much favor among beekeepers in parts of southern California. The inspectors of several counties, among them Los Angeles, San Diego and Riverside, have been inspecting and visiting among the beekeepers, taking with them one or two successful apiarists as a sort of advisory and encouraging committee. More especially is this being tried out where the beekeeper has been in business only a short time.

Meeting as poor a season as 1923 has proved to be, with perhaps some disease among his colonies, is certainly discouraging to the beginner as well as to the old-time beekeeper. It generally pleases the people to have visitors, and often much valuable information is received, for "in the multitude of counselors there is wisdom." To know that these visitors have passed through poor seasons before, that you are not alone in your crop failure and that good seasons always come again if you stay with it and keep your bees ready, at least encourages one.

November is plenty late enough to do any feeding that is necessary to get colonies supplied with stores for winter. Especially is this true if liquid stores are fed. If one is fortunate enough to have combs of sealed honey, they can be put in at any time when the weather is warm enough.

There are many ways of giving liquid feed. Perhaps as good a way as any is to fill the combs with the feed and then, if the colonies are destitute or nearly so, place them in the brood-chamber. If the colony is not in such a starving condition and needs only additional stores, a good way is to place a paper or cloth over the brood-chamber, leaving a small opening at one end, and then put on the super, placing the combs of liquid feed in the super. Late in the afternoon is the best time to feed as the colonies, if at all strong, will carry most of the liquid below before morning. At any rate, they will have all of the waste honey cleaned up, so that little or no fear need be felt as to robbing.

"Yes, we have no honey today" can be sung very truthfully by many colonies of bees throughout southern California. In my own case, I find a great difference in various locations and apiaries. Locations, that never before failed to give a flow of honey for summer and early fall, have this year failed to furnish any honey. Bees on these locations are almost destitute of supplies, while on some of the less attractive ones, they have plenty of stores. Verily, no two seasons are alike in California.

Now comes friend Richter, with his tale of woe from northern California. It is only by thus hearing from the other fellow that we are able to bring ourselves to that state of mind whereby we can feel that, as the years go by, one by one, we had better just stay with our same old stand and, in the long run, we will get our share of honey as well as some of the pleasures of life.

Corona, Calif. L. L. Andrews.

* * *

In Northern California.—There has been a light flow from honeydew or blue curls according to reports from various districts. At any rate some of our colonies, without resorting to feeding, will have by November sufficient young bees to insure successful wintering or rather successful breeding-up during early spring. In addition to this our bees will need from 25 to 50 pounds of honey to the colony according to location or whether or not the bees are moved to an early flow. This year especially, it will pay every beekeeper to lay special stress on young bees and ample stores, for the mortality of colony population in the state is going to be very high this winter, and there should be a good demand for the honey that is produced next year. There will be no carry-over of this year's crop, and opening prices next summer, especially of the higher-grade honeys,

ought to be very attractive. The San Francisco market is especially bare of white and water-white grades, and bottlers are greatly concerned as to where they are going to get their season's supply. Some honey for this purpose has been brought in from Arizona.

What might seriously affect the alfalfa honey crop in this state is the presence of the alfalfa eel-worm—a very destructive insect capable of destroying entire fields of alfalfa. It has done untold damage in South Africa and is beginning to cause serious trouble in some of our states. The fact that it has been found recently in California, Colorado and elsewhere has caused the U. S. Department of Agriculture to issue an appeal to its agents throughout the country for prompt and aggressive action.

It is an excellent time now, before the rainy weather sets in, to apply a coat of paint to all hive materials that are in need. At this time before most beekeepers take their inventory, it is well to have all equipment put in order for next season, discarding that which can not be put into first-class condition. Poor comb should be melted and the good frames put in order. Tops and bottoms, if no longer serviceable as such, can be used as shade-boards or as tops and bottoms for decoy hives. This winter will be the best time to gather together all of the dilapidated and otherwise unfit hive bodies and fit them up into decoy hives by bringing into use also the cast-off tops and bottoms. It is well to nail the bottom fast, and a frame containing a piece of dry comb is all the necessary furnishing that the decoy needs. The cover also should be nailed down with two small nails. In this manner decoys can be handled easily. Decoys should have ample ventilation—more in fact than the ordinary hive has through its regular entrance. Thus, ill-fitting, unpainted hive bodies, tops and bottoms make ideal decoys. We place our decoys just outside our yards or where we are in the habit of looking for swarms. We soon learn to find the favorite clustering places about the yard, and in these haunts we install about eight or ten decoys, preferably up off the ground several feet and fastened usually to a tree. In this way they are more conspicuously placed and less likely to be mauled by cattle and the like. The reason for placing the decoys where the swarms usually cluster is not with the idea of enticing swarms to enter, but for convenience only. During swarming season we do look for swarms about the yard, and it is no trouble then to examine the decoys. Some beekeepers catch annually from 40 to 70 swarms in decoys, and at the same time lose very little of their valuable time which should be devoted to their more important bee work. With us, we believe 20% to 30% of swarms entering decoys come from the outside, that is to say, they are not swarms from our own bees. But the point is this: Do not wait till spring before fitting up and setting out decoys; do it now instead. Your time is too valuable in the spring to waste with decoys.

Big Sur, Calif. M. C. Richter.

* * *

In Texas.—Throughout September the weather was ideal for brood-rearing in all of Texas. By the last of the month from six to twelve frames of brood per colony could be found in any yard. There are few colonies of bees that have stores sufficient to winter this oncoming force of workers. There is, however, hope of a fall bloom. In the extreme southwest como is just ready to bloom. In the central and northern parts broomweed is abundant and blooming. The entire eastern half of the state is yellow with bitterweed, the bane of the beekeeper, but the salvation of many a colony of bees. Every beekeeper in the state should go through his bees early in November and put in feed where necessary. Remember that sugar is cheaper than bees.

The eclipse of the sun on September 10 gave a good opportunity to observe the effect of an 85 per cent eclipse on the bees. The eclipse began at 2:17 p. m. and lasted until 4:43 p. m. The afternoon was warm and the sky partly cloudy, but the sun was not covered by clouds during the eclipse. There was a good flow on from whitebrush, and the bees were working heavily. A few minutes after the moon's shadow came on, the bees acted just as they do before a spring shower. They seemed to double their speed as if to finish work before the coming rain. In this case no rain came, and the actions of the bees became normal by the time the eclipse had reached its greatest extent. During the passing of the shadow the bees acted just as they do at the close of a summer shower. Large numbers of workers lay out in front of the hives, and the field bees rushed to the field again as if to collect the stored-up nectar.

Notwithstanding the fact that certain beekeepers report from 20% to 80% of a crop, the general average is very low. When asked for a report on their honey yield, most beekeepers will reply, "I took no honey, not enough for the bees to winter on," or "not enough to pay to extract." This condition makes it hard to get anything like an approximate estimate of the yield. Owing to the two years' failure, many bees are for sale and

many beekeepers are neglecting their bees. All beekeepers should remember that, if bees are neglected in the fall, they can not be expected to do their best in the spring. They should also remember that the observations of the old-time beekeepers are that heavy honey flows come only after normal or wet falls and winters, and during this fall more than the normal amount of water has fallen. All honey plants are in fine condition.

Beekeepers are certainly trying out fall requeening this year. In August the queen-breeders of the state reported no demand for queens. Now the demand can not be filled.

Some heavy transfers of bees have been made in the past month. The Ault Bee Company was the purchaser of a large number of apiaries.

Dr. M. C. Tanquary, the head of the bee work in Texas, attended the Miller Memorial meeting at Madison, Wis.

San Antonio, Texas. H. B. Parks.

* * *

In British Columbia.—British Columbia's honey crop has been a poor one this year in comparison with the last, and it is doubtful if the general average production will amount to more than about 30 pounds per colony. There has been an increase in the number of beekeepers and also in the number of colonies independently of this. Last year's good crop had the effect of inducing more people to keep bees, and a number of those already in the business increased their number of colonies by getting in package bees in the spring. Neither fireweed nor milkweed appears to have yielded any appreciable quantity of nectar in any part of the province. A report recently to hand from the Bulkley Valley in the far north states there is no crop here and that no nectar was gathered after the saskatoon, or service-berry, bloomed. Whether caused by the heavy electrical storms, which ushered in and continued through the month of August, the masses of fireweed failed to bloom, as did also the goldenrod and remaining fall flowers such as asters. The few blooms there were, carried no nectar, not even sweet clover.

The maples gave a surplus in the early part of the year in the Coast districts of the Lower Mainland, which was followed by a very good flow from alsike and white clovers for a limited period. In the irrigated districts of the interior there has been a fair surplus from alfalfa and sweet clover.

A theory was advanced some little time ago that a favorable spring, when there were no setbacks or interruptions to the growth of vegetation, would result in larger honey yields, on account of greater reserves of starch being accumulated and stored up in the root systems of nectar-yielding plants, which would be available later in the season to be drawn upon for the more copious secretion of nectar. This theory does not appear to have been realized this season. The spring of 1923 was an ideal one here, with no severe frosts or other adverse weather conditions to check or retard growth in any way.

A poor honey season in British Columbia usually results in a larger percentage of winter losses, caused, as a rule, through the bees storing greater quantities of fruit juice and honeydew than they do when more nectar is available. This, of course, can be guarded against by removing it and feeding for winter with sugar syrup. A good many beekeepers, especially those new at the business, fail to realize the importance of this, the result being heavy mortality in winter from dysentery.

Beautiful weather continued during the whole week of the Provincial Exhibition at New Westminster, September 10-15, and there was a record attendance, 98,235 visitors paying for admission. There was keen competition in most of the honey classes displayed in the annex of the Horticultural Building, the permanent quarters set apart for the exhibits of apiary products. The amount of honey shown was not so great in the aggregate as last year, but the arrangement was more effective and attractive. The gold medal donated by the Hudson Bay Company for the exhibitor scoring the highest number of points was won by T. L. Baker, Bradner, B. C.

Nelson, B. C. W. J. Sheppard.

* * *

In Utah.—On Oct. 4, ten committees, appointed by President Petersen of the Utah Agricultural College, met in the capitol at Salt Lake City to discuss plans for better crop and marketing conditions. The various committees represent all phases of agriculture, and, as beekeeping is one phase, I was on that committee. We meet again in December to receive reports of the various committees and formulate plans to grade, standardize and market all crops better. No branch is in greater need of this than the honey producers.

Most of the honey has already been contracted for or gone forward at this time. The two carloads we produced were included in the latter.

The crop in Utah was spotted, the average over the state being about 60 pounds, although the yield of our own bees in the northern part of the state was 202 pounds of extracted honey and 110 pounds of comb honey, spring count. Bees in this part of the state are going

into winter in fine condition with plenty of stores and young bees. The ample rains through September and thus far in October have put all honey plants in the best fall condition.

But, of course, there is many a slip yet between now and the next honey crop, although present conditions argue well for next year's crop.

There seems to be a greater wholesale than retail demand for honey at this time. I have had inquiries for some ten carloads since I sold my own, and most inquiries are for comb honey. I think I shall produce mostly comb honey next year, as I have the equipment and much prefer that branch of the work.

While in some sections of our country many are going out of the business, it is not so here, The great need is not for more beekeepers but for better ones. It is a pity to look at the comb honey on the city markets that is produced by imitators and sold at what it will bring. This means prices are ruinous to the producer who puts a well-graded, honest product on the market. M. A. Gill.

Hiram, Utah.

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In Wisconsin.— Beekeepers in most of Wisconsin have had a very successful year. If anything, the crop has been a little above normal when taken as an average for the state. A few have not done so well, but honey is quite plentiful.

Many of the larger beekeepers have made little or no effort to dispose of their crops because of the low local prices. For some unknown reason, honey has not been moving as well as in the past years, and the market is very slow.

It is interesting to know that a good many inquiries from orchard sections outside of Wisconsin have come in to the state secretary's office asking for information concerning beekeeping locations in Wisconsin. Their reason for wishing to make a change is entirely due to their bees being killed by poison sprays. The poison-spray situation seems to be getting more serious each year, as the number of fruit-growers who are spraying increases.

The honey plants of Wisconsin are in excellent condition for next year. There has been an unusual amount of rainfall, and the clover should be very abundant unless killed out in the winter.

Reports from beekeepers indicate that the bees are in a better condition at this time of the year than normal. Wisconsin beekeepers seem to be acquiring the habit of holding more honey stores for winter and spring feed. The bees will undoubtedly be in first-class condition when put into winter quarters.

Several of our beekeepers have imported some heather plants from Europe and are making an effort to establish this plant in Wisconsin. Whether or not it will secrete nectar is a question which only time can tell.

The next meeting of the Wisconsin State Beekeepers' Association will be held at Milwaukee during the Wisconsin Markets Exposition, December 6 and 7. It is the plan of the association to have a honey booth similar to the one last year. Members of the association have donated sufficient quantities of honey and funds adequately to take care of this booth. It will be used for advertising the trade-mark of the State Association. Orders will be taken for honey both retail and wholesale.

Madison, Wis. H. F. Wilson.

* * *

In Michigan. The mornings of October 6 and 7 witnessed the first general hard frost for this vicinity; but, so far as the secretion of nectar is concerned, it would have made little difference if it had come earlier. I have learned that, after the first week in September, even though there had been no frost and the bloom was profuse, there has been practically no secretion of nectar.

I always start to get all supers off directly after the first of the month, before the bees don their war paint and prepare to resist all efforts to molest them.

The season, in general, was good and, when the white crop was removed on August 1, there was more honey than is usual in the brood-chambers.

At the close of the white honey harvest is the time that commercial beekeepers make their general increase in colonies while there is an enormous number of bees. While it may not be in accord with the generally accepted idea that old bees are not good nurse bees, yet the plan works out well. With the young laying queen given to the colony composed principally of old field bees, a large amount of brood is raised, and these colonies make our best honey-gatherers the following year.

This season August proved dry and September wet—both in excess, which worked against the increase, and I found it advisable to double back nearly all that was made.

There was very little honey stored this year; in fact, many colonies nearly starved, and brood-rearing was held up to the extent that I fear there may be a lack of young bees for the hard winter ahead. Should we have a winter and spring anything like a year ago, there surely will be a very heavy shortage in colonies for 1924 as there are many less going into winter quarters this fall than last fall. Disease has taken quite a

heavy toll in colonies; but the area-clean-up methods employed by the Department of Agriculture, under the able direction of Prof. B. F. Kindig, should be felt directly, as the deputies have carefully gone through nearly all apiaries in this vicinity and have burned up many old piles of discarded combs and hives which were stored in old buildings and which were a continual source of infection.

Honey is moving fairly well; much was taken away by summer resorters on leaving for home. Prices seem to be quite uniform, $1.00 being the price asked for the 5-pound pails in the producing area. At the places where it is shipped in, the price naturally tends upwards, and $1.25 seems popular. Comb honey is not very plentiful and merchants generally are desirous of obtaining more. All in all, the situation is good and the bee-industry appears to be in a very healthy condition.

East Jordan, Mich. I. D. Bartlett.

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In Manitoba.—During the latter part of August and early September our beekeepers take advantage of a splendid opportunity to advertise their honey crop. This is afforded by the Garden shows held by the various horticultural associations.

Western gardeners display a great deal of enthusiasm at these fairs, which were first organized in the war days to boost the production of vegetables. Later, they became an institution, and as they widened their field they took in the beekeepers. At first, only one or two classes were allowed; but, during the last two years since the Department of Agriculture began to spend some money in this work, these developed into divisions offering in some of the larger societies close to $100 in premium money. One of these little fairs boasted over 40 entries in their honey division this year.

After the smaller fairs are over, a large Provincial Garden show is held in the city of Winnipeg where the winners in the smaller districts vie with each other for the provincial honors in fruit, vegetable, flower and honey classes. Two years ago, the late Mayor Parnell of Winnipeg was so impressed with the honey exhibit that he offered a handsome silver cup for the championship in the honey classes. Before this cup had been won the first time, Mr. Parnell's death was announced, and before the next Garden show came around, his associates in business decided that they would change the terms so that, instead of this trophy being won outright in three years as was first decided on, the winner would hold it for only one year and that they would donate a miniature each year to be won outright. Thus we have had our honey classes placed high up in standing. We have been promised for next year another and larger silver cup, which will probably be given to the winner in the display class.

At the Provincial Fair we had 53 entries of honey and bees, and the classes were very hard to judge. Some of the competitors had already shown their product two or three times and watched closely the system of making awards, so that where one judge was employed at all of these shows, his work was not easy.

The winner of the cup in 1922 stated that he received small orders amounting in the aggregate to half a ton of honey on the day after his winnings had been announced in the city papers.

At the date of writing, October 10, we are enjoying beautiful summer weather and have had only one or two light frosts. The ground is very dry, and the queens have about stopped egg-laying for the season. Some of our larger producers are still extracting, but expect to finish in another week. We hope to have the final crop report ready by November 1. L. T. Floyd.

Winnipeg, Canada.

* * *

In Alabama. Alabama now has a good foul brood law and, if we can secure an appropriation sufficient to carry on the work, this will be in operation at the beginning of next season. This should be of interest to beekeepers throughout the country, on account of the extensive queen and package business done here.

This state has up to this time very little foul brood, and, if we can get a good inspector on the job before it spreads too far, there will be little danger from it.

The season just passed is the poorest that we have ever had in this territory. There has been absolutely no honey taken in the black belt, and tons of sugar are necessary to carry the bees through the winter in good condition. With the price of sugar where it is now and still rising, this is a very expensive proposition, especially when one considers that it takes two to three times as much stores to winter a colony here as it does further north.

This condition has caused many bees to be offered for sale; but, with two very short years in succession, few of the regular queen-breeders or honey producers are in position to buy.

The prospects for a good crop next year are good now. There is a fine crop of young clover to bloom next year; but, unless we have better seasons than we have had in the last two years, this will be ruined. J. M. Cutts.

Montgomery, Ala.

In Ontario.— This is October 9, and for the past 10 days the weather has been that peculiar hazy variety characteristic of the season. While it has been too dry to suit the farmer who has fall plowing to do, yet this weather is ideal for the beekeeper who has fall feeding and packing to do as well as other work incidental to the coming winter season here in the north.

Honey is cheap and sugar very dear, comparatively speaking, yet we are not curtailing our usual feeding by any means; for with us at least, an abundance of sugar syrup in the hives in the late fall is the best form of insurance in which we can invest. Many ask why we sell our buckwheat honey at 7 cents per pound and buy sugar for winter stores at 10½ cents per pound. Frankly, I do not like the proposition; but what other method can we follow? When we remove the supers in September many colonies, in fact, the great majority of them, are too light to winter if left as they are. We cannot think of feeding liquid honey. For various reasons that is out of the question. True, we might save out combs of honey and place them in the brood-chambers at the close of the season, but I dislike doing that. In the first place, we have enough outbreaks of foul brood each season without taking chances like that; and, again, I dislike tearing out combs from the brood-chamber in early October, which is as soon as we could get time to do it. I always think that such a practice throws everything out of its natural order when done so late in the season, and we have not had good wintering when we followed this procedure.

By using the so-called "food chamber," quite a bit of this feeding could be avoided; but, for reasons given in a former issue of this journal, we do not like the system at all in operating bees on a large scale, no matter what the other fellow thinks about the plan. So we are again feeding our bees in the old-fashioned way, much as we dislike selling honey for less than we are forced to pay for sugar.

Clover is looking good in our immediate vicinity, and prospects are normal for another year for the beekeeper so far as conditions can be determined at this time. Honey is moving freely at rather low prices, and the demand is much better than a month ago although the fruit season is still on. Two representatives of large stores in Toronto told me last week that their sales had never been so heavy as during the past 10 days, and they predicted that at the present rate of consumption honey would be cleaned up nicely late in the winter. Personally, our crop is already pretty well cleaned up. We have no carlots left, and the small quantity still on hand will go in orders during the next few weeks.

But as stated in the last issue, we are up against over-production or under-consumption (both terms mean the same to the producer), and what we need most of all is some form of advertising that will bring the value of honey as a food before the consumer. How that advertising can best be done is a problem yet unsolved. Possibly the "Ontario Producers Co-operative" may be able to devise ways and means to get around the difficulties that present themselves whenever this question is under consideration.

I have always been of the opinion that it is unwise to try to boost the price of any article over and above what it can be produced for plus a fair margin for profit to the producer. During the war, prices were too high, and that possibly accounts for scores going into the business who would not be there if they had not thought they saw a fortune in beekeeping at the then prevailing prices. Many of these same people are now seeing things in a different light. Since honey is now down to rock-bottom prices, perhaps the old law of supply and demand will, in the end, even things up again, as many will, no doubt, curtail their beekeeping operations, hoping to find something more remunerative for their labor and returns on their capital. Unfortunately, just at present all agricultural pursuits are in as bad condition as the beekeeping industry, or even worse. As beekeeping is essentially an agricultural pursuit, although many urban dwellers are in the game, it is not likely, after all, that so very many will abandon the industry until something much more attractive than can be seen at the present looms into view.

While the consumption of honey can be vastly increased with profit to the consumer and producer, yet after all is said and done, I believe that Canada eats more honey per capita than any other nation in the world. I can not give any accurate data to prove this statement; but I have an idea as to the number of millions of pounds of honey produced in Canada and I know pretty nearly what our population is. The eastern section of Canada (maritime provinces) has a low per capita consumption of honey. If the people there used as much honey as Ontario and the western provinces, I think there would be no challenge to my statement as to per capita consumption for the whole Dominion as compared with any other country on the globe. J. L. Byer.

Markham, Ontario.

HEADS OF GRAIN from DIFFERENT FIELDS

Heavy Feeding Results in Strong Colonies. This year there was not sufficient rain to bring out the desert bloom, so I had to feed two or three times, giving 10 pounds at each feeding to run them until the mesquite and alfalfa came into bloom. Those that were fed 10 pounds came through in about the same strength as those that needed no feeding; those that were given two feeds were still better; and those that were given three feeds were boiling over with bees when the mesquite honey flow came. It took about two tons to feed this way, which would not have been necessary had the desert flowers bloomed.

Buckeye, Ariz. B. A. Hadsell.

American Foul Brood in Villages. I have taken great great interest in the question of eradication of foul brood. At one time there were quite a number engaged in beekeeping here, some on a large scale and some "back-lotters" as we all are now. Foul brood came and wiped out almost every apiary in this locality. Whole yards expired before the owners knew what the ailment was. At one time I had six colonies in my back yard in this village, and they were all taken. A close neighbor has had three trials, and as many times has he been cleaned out. Other large yards in the country have shared the same fate as we back-lotters, until now there are only a few colonies in this locality. We scan your publication for a remedy. We discuss the chemical formula for the prevention and cure of the trouble and shake the swarms into new hives, but still the trouble stays. And, Mr. Editor, it will stay so long as there are bees in the walls of old buildings and in the forest trees. In the cornice of one of the churches of this town, in an almost inaccessible place, there has been a colony of bees for the past 10 years. Some years we see the bees coming and going all season. Possibly the next spring there will be no signs of life there. Before fall it is again tenanted, and that swarm stays a season or two; then it is gone. We know what is happening there. Every swarm that goes in there dies of foul brood, and as often our bees clean out the comb and bring the trouble home.

Between the siding and the sheating of an abandoned building away from town a colony of bees started housekeeping. About three weeks from that time some men tore the siding away and cleaned them out. It was a bad thing to do, but we got rid of that much menace. I think the greatest menace we have is in the colonies in trees in the woods. A friend of mine, who is a bee-hunter of years' experience, tells me that 75 per cent of the colonies in trees he cuts have foul brood. We may fight this trouble all we can, and possibly keep in check some, but it will be with us as long as as there are bees in trees and old buildings. Could we legislate against the bee-tree or the colony in the building? C. W. Vining.

Lakeview, Mich.

[American foul brood is much more difficult to control in villages and towns than in the open country where fewer people keep bees within range of any given apiary. In cases such as the above, the beekeepers should form a local association to fight the spread of disease. If each member of such an association would make it his business to ferret out and examine, if possible, every colony in his neighborhood it should not take long to clean up most of the disease. In some localities local associations have already practically eliminated American foul brood from entire counties.—Editor.]

Scottish Beekeeping. My acquaintance with Gleanings began many years ago when John H. Martin was a contributor, and I still remember "Rambler's" vivid accounts of beekeeping in the wilds of California. In after years I saw in Gleanings a photograph of the monument that marks the place where all that was mortal of "Rambler" lies buried; but, although gone to his long rest, he is not forgotten.

Although we do get occasional bad seasons such as 1922, Scotland is, on the whole, a very suitable country for beekeeping, and Scottish heather honey in the comb has during recent years been selling at one dollar a pound. Even in the excellent season of 1921 when my best colony stored over 200 pounds in sections, the selling price wholesale was 50 cents a pound, and I was quite unable to meet the demand. So, unlike American beekeepers, we have no marketing problems to cause concern.

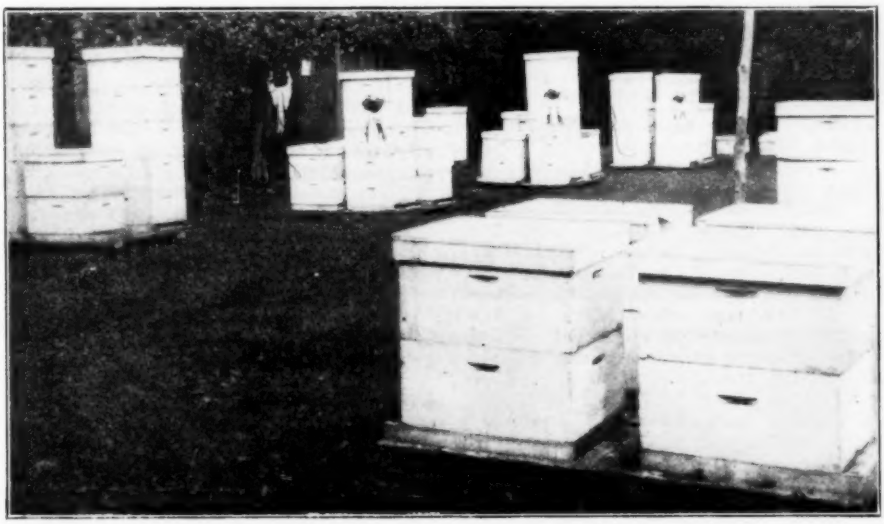
True, there is the mysterious Isle of Wight disease always present, but it is now better understood, and no compe-

tent beekeeper has any serious loss through this cause nowadays. Strangely enough, this once dreaded malady is not, strictly speaking, an infectious disease at all, and it is quite possible for some colonies to remain entirely unaffected in an otherwise diseased apiary. In such cases it is reasonable to suppose that all the colonies concerned are liable to be attacked by the mite *Tarsonemus woodi*, but only under certain conditions do the mites succeed in getting a footing.

Rigg Gretna, Scotland. J. M. Ellis.

Wintering in Extracting Supers. Last fall I found that a colony had gone into extracting supers to winter. It was a populous one, headed by a gentle queen. I asked professional beemen what to do and wrote to editors of bee journals. I got such a variety of advice that I thought I'd "go on my own" and try out a sort of "absent treatment." I just packed them up in a heavy case, with a foot of dry forest leaves on all sides, and a heaping pile of cornstalks about the hive-stand. The snow came down until it was two feet deep, then three. Finally the hive was drifted over. I kept the entrance open, which was the narrow one of the standard 10-frame hive. The bees got no cleansing flight for six weeks at a stretch, followed by another period of four weeks' confinement. Their stores were rather poor, mostly aster. According to some expert advice, they were doomed. They came out in spring weak with dysentery, from poor stores and long confinement. But they were ready to work. I got a super with some stores upon them one bright, sunny day in late March. They made the finest colony I have ever seen. They superseded their queen in mid-May, with other bees still lagging. They started storing early in June. Their supersedure swarm came back to their happy home, self-hived, after the new queen's wedding flight. Before July 1 they had a double brood-chamber and two supers full to the good, and had half filled the third. Now, on that showing I wouldn't advise anyone to put bees in extracting supers on purpose; but if they get in late, give them plenty of stores, a good winter case, intelligent spring care and see if they don't do fairly well. Of course some old-timer may arise and say, like the Irishman who heard that a man had lived to be 100 and had never used tobacco: "But if he'd used it he might have been 120 now." So the old timer may say that if those bees had wintered in a single story they might have filled a barrel or two by July 4. George Gilbert.

Port Dickinson, N. Y.



"Telling the bees" at the experimental apiary of the U. S. Department of Agriculture near Washington, D. C.

Maintaining the Traditions. The ancient custom of "telling the bees" when their owner dies, to prevent their desertion of the hives, is not considered necessary according to modern beekeeping beliefs, and one does not hear of this practice being faithfully observed in progressive communities, as

is recorded in Whittier's beautiful poem. While we at the Bee Culture Laboratory rather pride ourselves on freedom from superstitions, at the same time all beekeeping traditions need not be put into the discard, so when W. J. Nolan recently surprised his co-workers by being married, it seemed fitting that the glad tidings be communicated in some way to those colonies with which he works in his investigations. The accompanying illustration shows how this was done. Bunches of goldenrod tied with white cloth were placed on each group of his hives and on the door of his work-shed, and a suitable revision of Whittier's poem was tacked to the door. None of the colonies have deserted since the wedding, which proves that the "telling" was successfully carried out. Even though this observance of tradition probably made little impression on the bees, we hope that the newly-weds accept it as an expression of hearty good wishes from the staff. E. F. Phillips.

Washington, D. C.

The Bees of India. I have eight colonies of the local bees (*Apis indica*) which are smaller bees than the European races and marked somewhat like the Italians. They are not considered very good honey gatherers and are given to swarming a great deal. My oldest colony is only about nine months old and has cast a first swarm. They had at one time about four to five pounds of honey stored but not capped over. Many of the drones are able to get through the Root queen and drone trap.

I am only a beginner, and picked up just a few hints in Scotland last winter. I had never seen bees kept in this way before, so I was very much interested and brought out a hive without bees and some appliances to make use of the native bees of this country. There are several varieties of these, *Apis indica* closely resembling the ordinary honeybee of Europe. The best honey gatherer is undoubtedly *Apis dorsata*, a large, brown powerful bee. They build a single tough comb up to 6 feet across by 2½ to 3 feet deep and 3 inches thick. A single comb often yields up to 80 pounds of honey. Sometimes over 100 colonies may be seen hanging from the branches of a single tree. P. Achard.

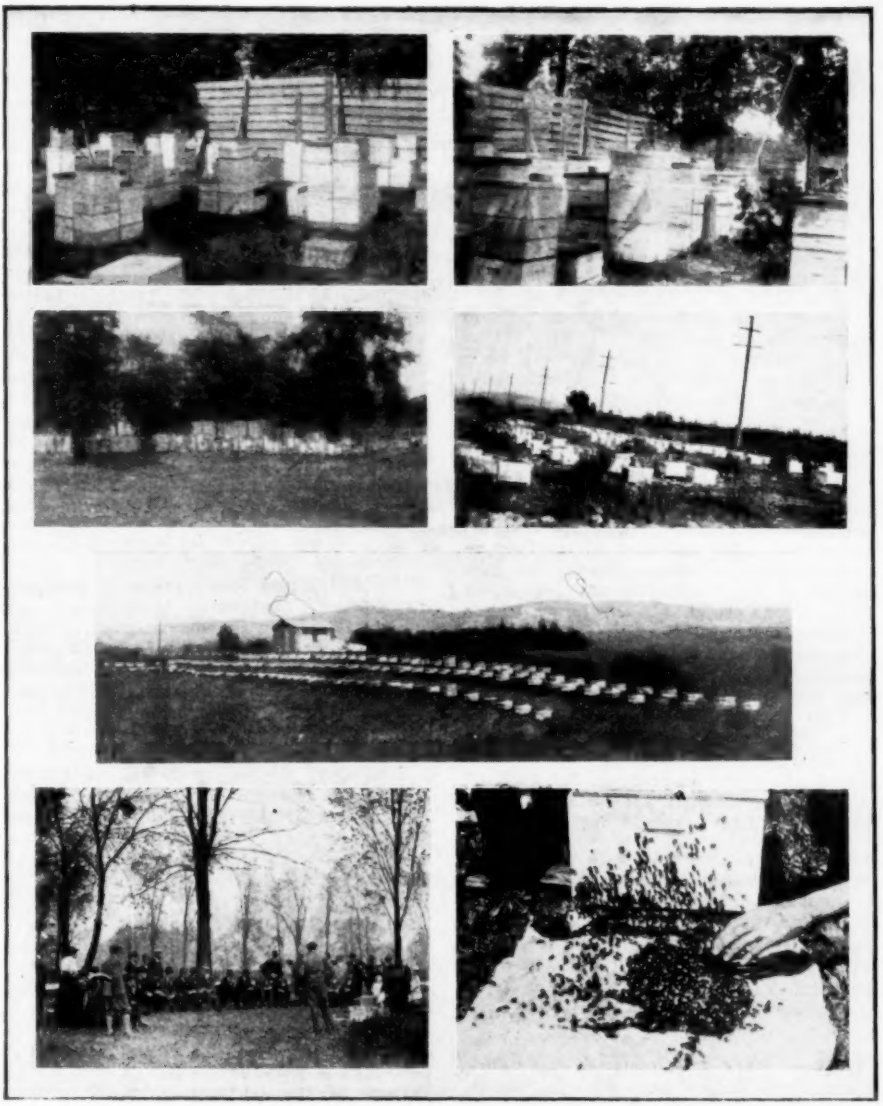
Hardypet P. O., South India.

Making Syrup With Cold Water. I have just been greatly interested in your editorial under the head, "Tartaric Acid in Syrup." I was one of the first to practice heavy feeding of syrup in Manitoba, at the suggestion of the late Mr. Sladen. I used to mix 100 pounds of sugar with 50 pints of water. The syrup was prepared several days beforehand and dissolved in the honey tank as follows: First, I placed enough boiling water for the first bag of sugar, then the sugar was added slowly with continuous stirring. After the operation was started, fresh supplies of cold water were added and more sugar as fast as it would dissolve, the proportion mentioned above being maintained. The tank was stirred thoroughly every hour or so for a couple of days, and then left overnight to settle all undissolved crystals or impurities. We used no acid. For feeding, the usual 10-pound pails with perforated covers were used, and the bees would take down the syrup in quick time. After we adopted this form of feeding, we had very small losses and no granulation. The last winter we were there, I packed eight colonies in sawdust (8 inches on sides and 12 on top) and left the cases out where they were exposed to the full sweep of the prairie winds. Before spring the snow had drifted level with the tops of the cases, but the bees all came out strong except one pair which were smothered by the packing blocking the entrance. These were fed all the syrup they would take in October.

Monterey Park, Cal. Hy W. Sanders.

Securing Good Prices for Honey. I have a honey trade that will pay me any price I care to ask. It was built up to this standard by my always giving the people as good honey as possible, and giving them the grade they are expecting. I guarantee every pound of honey I sell, and agree to refund the money they pay for the honey, if they are not entirely satisfied. The average beekeeper seems to think he can not get more for his honey than his neighbor who is selling too cheap, but he is mistaken. All he needs to do, is to be more careful in grading and packing his honey, and have a smart trade-mark. He will not need to tell the people that his honey is better than his neighbors', for they will be sure it is much better, and will pay the extra price. There is no surplus honey that is good table honey and will not be soon if beekeepers will only learn to be half as good salesmen as they are beekeepers. Beekeeping has developed to the point where it seems that it is now time to study salesmanship in connection with beekeeping, for that is the most vital and valuable thing about it, anyway. Luther A. Fink.

Carthage, N. C.



The two top illustrations represent a couple of the A. I. Root Company's apiaries in the midst of a summer honey harvest. The fence in the background is made up of panels of eight-inch boards spaced two inches apart. These panels are held in position by means of braces nailed to stakes in the ground. The idea of having a fence made up in panels is that it may be moved whenever the pasturage fails for any reason. Spacing the boards two inches apart as shown breaks the force of the wind without diverting it over the top and causing it to swoop down with great force on the other side as in case of a solid board fence.

The next lower illustration, on the left, shows another view of one of the Root yards, which we always try to locate in a small grove for shade. These trees shade the hives at least during a part of the day in summer, but permit the sun to shine on them in winter and early spring when the leaves are off and when the sunshine is most needed.

The illustration on the right shows a California apiary out in the open. Windbreaks are not necessary in that state. In case of hot dry winds that sometimes come, windbreaks would be worse than useless.

The center illustration shows a Colorado apiary. Most of the yards in that state have no windbreaks, as they are not needed.

The lower illustration on the left is of a field day in Canada when the weather was cool enough to render an overcoat desirable.

The lower right-hand illustration shows shaking for foul brood at the field meet just mentioned. The bees, too, needed overcoats.

JUST NEWS

Editors

THE second annual meeting of the Finger Lake Honey Producers' Association will be held at the State Experiment Station, Geneva, N. Y., on Thursday, November 22, 1923. Among the prominent speakers who have promised to be there are Geo. H. Rea of The A. I. Root Company and R. B. Willson of the Extension Department of Cornell University. One of the features of the meeting will be a prize offered for the best homemade winter packing case on exhibition. C. D. Howard, Geneva, is secretary of this Association.

* * *

R. H. Kelty, East Lansing, Michigan, chairman of the Schedule Committee for the American Honey Producers' League, has arranged for a series of meeting in the northwest as follows: Minnesota, November 16-17; South Dakota, November 20-21; North Dakota, November 23-24; Montana, November 27-28; Wyoming, November 30 and December 1; Nebraska, December 3-4. Information as to the place where each of these meetings will be held is not at hand as we go to press, but those interested can obtain this information by writing to the secretary of the state association for each of the states mentioned, whose names and addresses will be found in our May issue.

* * *

The annual convention of the New Jersey Beekeepers' Association will be held on January 17 and 18, 1924, at Trenton, in connection with Agricultural Week activities, January 15 to 18, 1924. Jay Smith of Vincennes, Indiana, has been engaged as one of the speakers.

* * *

Wallace Park has resigned his work at the Iowa Experiment Station, Ames, Iowa, to take charge of the beekeeping work in the Department of Entomology at the University of Illinois. R. L. Parker of the Iowa State College has been transferred to take the place which Mr. Park left.

* * *

Dr. Arnold P. Sturtevant, who has been doing the work in bee diseases for the Bureau of Entomology, Department of Agriculture, Washington, D. C., has resigned his position there to accept a position as Assistant Professor of Bacteriology in the New York Homeopathic Medical College in New York City.

The Wisconsin State Beekeepers' Association will devote the entire week, November 19 to 25, to a campaign of publicity about honey. Every member of the Association is urged to join in this honey-selling campaign. The State Association is mailing out literature to its membership, suggesting various ways in which the individual beekeepers can help in this campaign.

* * *

The Indiana State Beekeepers' Association will hold its annual meeting at Indianapolis on Thursday and Friday, December 13 and 14. C. O. Yost, State House, Indianapolis, is secretary of this association.

* * *

"L'Apiculture Intensive et L'Elevage de Reines" (Intensive Beekeeping and Queen Rearing) is the title of a new book in French by A. Perret-Moisonneuve, that has just reached the editor's desk. In this work the subject of queen-rearing is given great prominence.

* * *

Thursday, November 8, will be Honey Day at the Eastern Apple Exposition and Fruit Show at the Grand Central Palace, New York City. The program will open at 2 p. m. with an address by Dr. E. F. Phillips of the Bureau of Entomology at Washington, D. C., on "The Honeys of America." In connection with this address Dr. Phillips will exhibit a collection of some 250 samples of American honeys. E. R. Root of The A. I. Root Company has been invited to talk on "Facts About Honey," a talk which is extremely interesting not only to honey producers but to the general public. Prof. H. F. Wilson of the University of Wisconsin has been invited to talk on "The Place of the Honeybee in American Agriculture," and John M. Kelley has been invited to talk on "American Advertising and Its Application to the Marketing of Honey." A number of large honey exhibits will be on display at this show. New York will have a large educational honey exhibit as well as a sales exhibit. Everyone who goes by these exhibits will be invited to taste "Blossom-Sweet Honey," the trade name of the honey that is being put up and sold by the Empire Honey Marketing Co-operative Association, Inc.

BEES, MEN AND THINGS

(You may find it here)

AMERICAN foul brood is spreading throughout Allegheny and Westmoreland counties and we are without inspection in both counties. A neighbor beekeeper less than a quarter of a mile away had 16 good colonies free from disease last fall; but in October he cut a bee-tree and fed the honey he got from it to all his bees and all of them developed foul brood this spring. This fall he had six colonies left, all badly diseased. I induced him to let me help shake all the bees from the six hives into a large box for five days, then shake them into a two-story 10-frame hive on full sheets of foundation and feed them for winter with sugar syrup. He took all the old hives and combs into a tight cellar for treatment or destruction, which removes the danger to other bees."—W. D. Keyes, Allegheny County, Penn.

Last winter having a quantity of fall honey, such as aster and goldenrod, I wondered why it could not be dipped in chocolate and sold as candy. I dipped a small amount and sold it at a local store at a nickel a bar. It went like hot cakes. This honey granulated soft and smooth. Honey that granulates hard like clover does not sell so well."—P. L. Conaway, Dearborn County, Indiana.

"Occasionally I hit upon some idea that might help a little. Has any one ever suggested using a large burlap sack stuffed with straw, placed in the bottom of a wheelbarrow to remove the jar that is so annoying to bees when moving them into the cellar? It works fine and is better than a spring wheelbarrow."—M. R. Thompson, Roseau County, Minn.

"'Better keep bees better, or better not keep bees,' was the slogan adopted by the Department of Apiary Products at the 1923 Missouri State Fair, held at Sedalia, August 18 to 25, as typical of its policy in the promotion of advanced methods in beekeeping throughout the state. An exhibition of all varieties and kinds of bee equipment was featured in the general display. This formed the center of attraction for visitors interested in bee culture and achieved a result both interesting and educational."—L. A. Schott, Missouri.

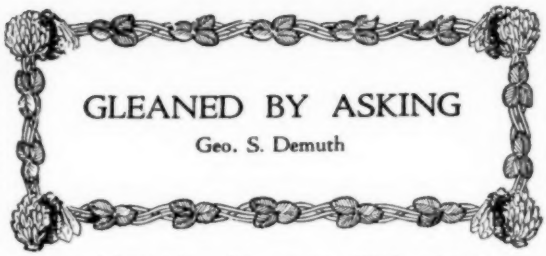
"When one has a small crop of honey it can, of course, be sold direct to the consumer; but, where it is produced by the carload, it will pay to sell it to the consumer's merchant, that is, canvass the consumers, secure their orders for as much as they can be induced to take and have their merchant make the delivery. The merchant will, of course, buy more honey for stock than is sold to his trade, and in this way many new customers will be created. The price of the honey to the merchant should be a little higher for filling the orders turned in from canvassing than for that which is sold to him for stock, thus paying for the canvassing. No merchant will object to this; in fact, they will appreciate the advertising that it gives them."—Luther A. Fink, Moore County, N. C.

"Why not have a fair price for our honey and not try to gouge the many people that use our honey? Our sales will be better and more people will also be induced to use it. Honey to the consumer at $1.50 per five-pound pail is unreasonable, even if the larger beekeepers in this community think otherwise."—J. B. Pace, Todd County, Kentucky.

"The beekeepers of the Black Belt of Alabama reported no surplus honey at all for this year and many of them will have to feed to carry their bees through the winter. The prospects for good crops in the future are poor also, for sweet clover is the main source of nectar in this region and most of the waste land is being converted into pastures for sheep and dairy cows, which are practically destroying this plant."—Majors Nordan, Jefferson County, Alabama.

"You will be interested to know that Mrs. Miller has given the set of honey dishes, mentioned in Dr. Miller's "Fifty Years Among the Bees,' to the Miller Memorial Library. I plan to have these put in a glass case which will be in the main Agricultural Library. We expect to put some other exhibits in the same case as they may be accumulated."—H. F. Wilson, Wisconsin.

"Our two races of stingless bees living in our low tropical lands are named by us *Melipona Fulvipes*, the greater banded like Italians, and *Trigona Cilipes*, the smaller black ones. Our Mexican Indians call them 'Colmena Real' (Royal bees). Wasps we call *Avispas*. The honey from the *Melipona* called 'Virgin Honey' is a dark and acid honey."—Jose Rivero Carvallo, Pueblo, Mexico.



QUESTION.—An old beekeeper tells me that he thinks quite often American foul brood comes from some spraying material. Do you find this to be true?
Wiley Whitehead.
Iowa.

Answer.—American foul brood is a disease of the larvae brought about by living germs taken in the food. It could not possibly come from spraying material. It can only be produced by the bees carrying in the germs with honey from a diseased colony. In other words, if there is no American foul brood within range of your bees and if diseased material is not carried to them from some other apiary, your colonies will never have American foul brood.

Using Honey in Making Syrup.

Question.—Is not the use of honey in making syrup for fall feeding as good as tartaric acid to prevent granulation?
Iowa. E. G. Draeger.

Answer.—Yes. To make the syrup, using honey instead of acid, put a gallon of water into a boiler and heat it to the boiling point; then stir in two gallons of granulated sugar, continuing the heat until the sugar is thoroughly dissolved. As the syrup is cooling, add four or five pounds of well-ripened honey. Larger or smaller quantities can be made in the same proportions. Syrup made in this way does not need acid to prevent granulation. The reason that this formula for making syrup is not ordinarily recommended now is because of the danger of spreading American foul brood through the honey if the honey is not known to have been stored by a healthy colony. Nothing but the best early-gathered honey should be used for this purpose.

Wintering in Two Stories.

Question.—Which is better, to winter the bees in a single story or in two stories?
Ohio. Elmer Lehman.

Answer.—That depends. Bees should winter better in a small winter chamber than in a large one, for there would be less space to keep warm. Colonies that occupy only a single brood-chamber in the fall should be wintered in the one story, as a rule; but colonies that occupy two stories in the fall, the upper one being well filled with honey, should not be disturbed by reducing them to one story at this time, in your locality. In the South there is no objection to leaving on the upper story during winter. Neither is there any objection in your locality provided the bees are well protected. In the extreme North it is probably better to crowd the bees down to a single story for winter. Those who are using the food chamber (shallow extracting super) filled with honey on top of the standard hive have been quite successful in wintering in this story-and-a-half hive even in the northern tier of states and in Ontario. Small colonies, however, should have their hives reduced so that the winter chamber will fit the size of the colony.

Wintering in a Damp Cellar.

Question.—Can bees be successfully wintered in a damp cellar, provided an empty super filled with dry chaff is placed next to the bees on each hive? Geo. S. Forsythe.
Connecticut.

Answer.—Bees can be wintered successfully in a damp cellar provided the temperature is kept high enough. In such a cellar the temperature should range in the neighborhood or 48° to 50°. It should be remembered that raising the temperature of the cellar reduces the relative humidity of the air within, or, in other words, makes the air relatively drier. You can improve the atmosphere of a damp cellar by putting in some unslacked lime to absorb some of the moisture. Ventilation will also help to keep the cellar dry, but too much ventilation in cold weather may reduce the temperature below what it should be if the cellar is not well protected. The super filled with chaff over the porous quilt will help keep the hives dry, but this may not be needed if the cellar is warm enough.

Stamping Net Weight on Sections of Comb Honey.

Question.—In marking comb honey for interstate shipments, would marking the minimum net weight of the sections on the outside of the shipping case answer the requirements of the law? L. J. Elwood.
New York.

Answer.—The Federal net weight law requires that the net weight be marked on the individual units in the case. To comply with the law when honey is shipped in interstate commerce, it is therefore necessary to mark the net weight on each section of comb honey. The net weight of the sections in a case may be marked on the outside of the case if desired, but such a mark cannot be substituted for the mark on each section. The Federal law applies only to honey shipped outside the state in which it was produced, or in the District of Columbia and other territories of the United

States. Several of the states having net weight statutes similar to those of the Federal law have ruled that comb honey, being a natural product, is not subject to the net weight law and need not be marked as to the net weight if sold within the state. For further information in regard to the requirements of the various states, see page 333 of the May, 1923, issue of Gleanings in Bee Culture.

Taking Bees from a Hollow Tree.

Question.—How can I transfer a colony of bees which has stored up honey for winter in a hollow tree? Ordean Anderson.
Minnesota.

Answer.—It will not be advisable to transfer the bees this late in the season. If the tree has been cut, it will be best to saw off the portion containing the bees and take it home, placing it where the colony is to be located next summer. This can be done at any time after the bees quit flying freely, so that none will go back to the old location if they are moved only a short distance. The colony can then be transferred in the spring.

Treating Diseased Colonies in the Fall.

Question.—Would it be safe to shake the bees from their combs in colonies having only a few cells of American foul brood, doing this after brood-rearing is over and shaking the bees into supers containing clean honey?
Missouri. Walter P. Brown.

Answer.—Yes. This is a good way to treat colonies at this season, provided solid combs of sealed honey free from disease are at hand. When treated in this way at this time, any diseased honey that the bees may carry with them will be consumed long before any of it could be fed to the larvae, for brood-rearing should not begin in your locality until in February or March. Some prefer to make sure that this honey is used up before the bees are put on the combs, by shaking the bees into an empty hive and confining them for 12 to 24 hours before giving the combs of honey. If the combs are entirely filled and sealed, this is not necessary.

The Trick in Live-Bee Demonstration.

Question.—Referring to page 614, September issue, how is the trick of getting the bees off the head performed after the demonstration? P. Menefee.
Ohio.

Answer.—The bees are simply combed out of the hair with the fingers. This must be done carefully, and there must be no crowding or pinching the bees. By gently drawing the fingers through the hair the bees will be dislodged into the hand, then a quick jerk will free them from the hand.

Boiled Honey for Winter Stores.

Question.—Is it safe to feed for winter honey that has been boiled and has a cooked taste? A. Mottaz.
Illinois.

Answer.—No. Honey that has been boiled is not fit for winter stores in your locality. This honey should be saved to feed to the bees in the spring for spring brood-rearing. Nothing but granulated sugar syrup or the very best honey should be given to the bees for winter stores.

Disposition of Combs Damaged by Moths.

Question.—I have a few combs which are slightly damaged by the larvae of the bee moth. Will the bees clean up and repair them next spring, or should they be cut out of the frames and full sheets of foundation put in their place? A. W. Lindsey.
Ohio.

Answer.—Combs that are only slightly damaged should by all means be saved and given back to the bees next spring or summer. After the combs have been exposed to a freezing temperature, there is no further danger from the larvae of the wax moth. The combs can then be placed in hive bodies covered tightly at top and bottom so that mice cannot enter. When these combs are given back to the bees in the spring, they will repair them so they should be as good as new. Where the damage is extensive so that the midrib is cut away, the bees would, as a rule, fill these with drone comb. To prevent this, you can repair these by cutting out the damaged portion and fitting in a piece of comb from some other damaged comb, or give these combs to nuclei to be repaired. When they are given to nuclei any holes through the midrib will be repaired with cells of worker size, making a beautiful job of it.

Sections in Shipping Case Upside Down.

Question.—Does it make any difference which side of a section is up when packing in shipping cases? J. F. Martin.
Idaho.

Answer.—In shipping comb honey the sections should be placed in the shipping case in the same position they were in the hive. Comb honey looks better when placed in the shipping cases right side up, and, if there is any breakage, more honey would run out of the combs if placed upside down. When the honey is first taken from the hive there is sometimes some leakage in sections turned upside down from thin nectar in open cells in the row next to the wood, because the cells slant downward when the comb is inverted instead of upward as they do when right side up.

Number of Bees in a Swarm.

Question.—What is the extreme range in number of bees in a swarm?
Missouri. John R. Funk.

Answer.—The number of bees in a swarm varies all the way from a mere handful, as in the last after-swarm or in a small nucleus that swarms out, up to as many as 10 or 12 pounds of bees. There are about 5000 bees in a pound, so that some of the largest swarms contain more than 50,000 workers.

Bees Cease Brood-Rearing Middle of September.

Question.—My bees have no eggs or young larvae the middle of September. Do you think these colonies can be wintered by good care?
Michigan. T. W. Ediger.

Answer.—If these colonies had reared considerable brood before the middle of September so that they were well supplied with young bees at that time, they should winter well even though no brood was reared after the middle of September. The time of the cessation of brood-rearing varies according to climatic conditions, but very late brood-rearing extending into October is not essential to good wintering. The young bees that emerged previous to the middle of September should be strong and vigorous in April, if conditions for wintering are favorable.

Giving Winter Flights in a Warm Room.

Question.—I intend to take out of the cellar three colonies that were fed brown sugar, taking them into a warm room to give them a flight in a large wire-screen cage. How many times should this be done during the winter?
Montana. M. A. Dimier.

Answer.—While bees have been given a winter flight as an experiment in a warm room as you suggest, the plan does not work out well. The disturbance of these flights and the excitement of the bees that fly out and find themselves imprisoned in the cage, together with the difficulty of getting them back into the hive, demoralizes the colonies. It will be much better to give these colonies another 10 pounds of syrup made of granulated sugar, even though it is now late for feeding, than to try to give them a winter flight made necessary by poor stores. If each of these colonies is fed 10 pounds of good thick syrup made as described in the October issue of Gleanings, this will be stored where it will be used first during the winter, leaving the poor stores until toward spring when they will do no harm.

Powdered Sugar Containing Corn Starch for Feeding Bees.

Question.—Is powdered sugar, which contains corn starch, suitable for feeding bees?
Illinois. M. G. Eldred.

Answer.—Since bees are not able to digest starch, sugar syrup made out of this sugar would not be suitable for feeding the bees for winter in localities where they are not able to take frequent cleansing flights. Only the best granulated sugar should be used for making syrup for winter feed, even though it costs considerably more.

Upward Ventilation for Winter.

Question.—Should the inner cover be left on when bees are wintered in single-walled hives or should it be taken off and a cushion placed inside a super directly over the frames?
Ohio. Isaac Grabb.

Answer.—If the hives are not packed, upward ventilation should be provided as you suggest. Upward ventilation is not necessary in your locality for well-protected colonies, for there should be no condensation of moisture within the hive when the hive is properly protected, but in single-walled hives there will be condensation of moisture within the hive unless some form of upward ventilation is provided. Care should be taken when such upward ventilation is given to see that the packing above is snugged down at the edges to prevent currents of warm air from passing out the top of the hive. It would be much better to prevent condensation of moisture in your locality by protecting the hive instead of by upward ventilation.

Scraping Hives from Diseased Colonies.

Question.—In scraping propolis from hives, which have contained diseased colonies on the work bench, is there any danger of spreading disease by the fine particles settling on supplies in the same room, or by nailing new supplies on the bench, provided all wax and propolis have been cleaned away?
Ohio. Elan Eby.

Answer.—It is doubtful if American foul brood is ever transmitted in this way. After the combs have been taken out and treated or destroyed and the inside of the hive has been scorched lightly, such hives are usually considered safe provided no honey is smeared on them, not even the smallest drop.

Law Governing Sale of Honeydew Honey.

Question.—Is honeydew or honey mixed with honeydew considered pure honey? Can it be sold as such without violating the law, or would honey mixed with a varying quantity of honeydew be classed as an adulterated product?
Rhode Island. Walter S. Place.

Answer.—Honeydew or honey mixed with a considerable amount of honeydew cannot legally be sold as pure honey, but should be labeled "Honeydew honey." A trace of honeydew in honey would probably not be considered adulteration, for it often happens that there is a trace of honeydew mixed with honey.

Tartaric Acid in Sugar Syrup.

Question.—Why use so much tartaric acid as advised on page 659, October issue, when less than half that amount will do?
Quebec. A. J. Gardner.

Answer.—The amount of tartaric acid needed to prevent granulation varies according to the density of the syrup, the time of feeding, the strength of the colonies, the temperature of the syrup when fed, and the kind of feeder used. When syrup is made a little less than two parts of sugar to one part of water and fed when cold in a friction-top-pail feeder having only about 30 holes, no acid is needed; but if the syrup is made heavier and is fed while hot in a feeder from which the bees will store it rapidly, there would probably be crystallization unless the larger amount is used. In any case only enough acid should be used to prevent crystallization. If there is no crystallization during the first week after being fed, there should be no trouble of this kind, for the bees in handling the syrup add enzymes which retard crystallization for some time.

A. I. Root's Story of His Own Life

"Charity suffereth long, and is kind; charity envieth not; charity vaunteth not itself, is not puffed up, doth not behave itself unseemly, seeketh not her own, is not easily provoked, thinketh no evil; rejoiceth not in iniquity, but rejoiceth in the truth; beareth all things, believeth all things, endureth all things."—I. Cor. 13:4-7.

JUST 21 years after my father's death, my mother, at the age of 90, was laid away to her rest. Mrs. Root and I were summoned by telegram on Sunday morning, Nov. 9, 1902, and we reached mother's bedside a little less than 48 hours before she breathed her last. She knew me when I spoke to her, but was too feeble to say much. She had asked for me, and it was a satisfaction to her to know that I was present with the rest of the children. While she gradually let go of earthly things she grasped the heavenly ones. She died of old age, and her descent to the edge of the dark river was very gradual, indeed.

During her last moments, and after her death, we talked over things and occurrences that happened during her long and useful life. When I say useful I do not mean particularly that she did a great deal of hard muscular work, yet God knows she toiled with hands, feet and brain, both early and late, until she was too old to work any more. It came over me then, as it never had before, what an untiring worker mother was. She was up early and late. Since father was away from home so much of the time, it was, for years, her practice to build the fire and then call the children. I remember that the time came when I declared mother should no longer build the fire; and, oh, how thankful I am that I took that task out of her hands, on cold winter mornings! During zero weather, the room in which the fire was built was anything but warm. It was not as warm and comfortable as most of your homes; and, come to think about it, in the greater part of our homes nowadays there is no fire to build—natural gas, base burner, furnace in the basement, or something of that kind, keeps fire all night; and such arrangements are, no doubt, very pleasant and comfortable; yet I very much doubt, dear friends, if the result produces the good, strong constitutions that come—well, let us say from living in a cabin in the woods, where zero weather reigns indoors, in the sleeping room as well as outside.

But I am not going to talk health just now. I wish to talk about the thought embodied in the text at the head of this chapter. If my mother's name were put in the place of "charity," it seems to me the verse would describe her exactly. No doubt thousands of you feel the same way about your mothers, and that is right. If it were not for these patient Christian mothers, the world would have been lost long ago.

One of the first things I can remember about my mother is her struggling in a meek, uncomplaining way, against not only inconveniences, but real difficulties and troubles. She never envied rich people. On the contrary, she always rejoiced to see any of her neighbors get ahead of us. I am sure this is true, dear reader, and I am sure of another thing: that this is not a very common trait with humanity. And mother was never "puffed up." Why, those who knew her will laugh when they think of the thing. Our good pastor, in his funeral sermon, made a remark to which I wanted to say "amen." But I was not the one to say it, and I believe it is not customary to say "amen" at funerals. The remark was something like this. "There was no sham about Grandma Root, as everybody will testify who knew her." Sham! why, bless your heart, she could not even appreciate a joke. Father and most of the children most keenly appreciated jokes, and often used them to turn away unpleasantness; but mother, in her simple, honest heartedness could never see the use of jokes or anything in the line of make-believe.

"Seeketh not her own." Why, there never was anything she called her own. Father used to have that one drawer in his bureau for his important papers; and woe to the child or anybody else who meddled with "pa's drawer." But mother had no drawer that I can remember. Everything that belonged to mother belonged to all of us; and, no matter how freely we helped ourselves to what was hers, we were sure there would not be any scolding. I was going to say she did not know how to scold, but that is not quite true. If we took anything that belonged to somebody else, she, as well as father, could then straighten us out.

"Thinketh no evil." If she had one characteristic above all others it was

this; and not only this, but it was hard work to make her believe that anybody was deliberately bad. She took it for granted at the outset that every one she met was a good man, woman or child; and it was very hard to convince her otherwise. There was once a Jew peddler who came to our neighborhood; and after he had fleeced the people right and left until he was notorious, he stopped one day to talk with mother. After he went away she said, before the rest of the family:

"Why, what a good man that old Mr. P. is!"

At this, we children, father included, burst out laughing at her innocent, honest simplicity. When we attempted to tell her of his tricks and hypocrisy she still insisted that there was a mistake somewhere, and that he was a good man. We all considered it the best joke of the season. Well, as I go back and think it over I recognize that it was so all through her life; and it was her privilege, if I may so call it, to talk with some of the wickedest men (and women, too) that can be found in any community. When she talked with them, she believed they were good and meant to do right, and I honestly believe that, while talking with Mother Root, they did mean to do better, to be more honest and true. Nay, more than that: I believe the glimpse they got of her true, honest, Christian life was such, that they were ever after better men and women for having had just one little talk with one who had "thought no evil" so emphatically all through her long life. I hardly need say she never rejoiced in iniquity. She was sorry for everybody in misfortune. The day of her funeral, an old neighbor who lived with her before I can remember told me that, in those early days in the woods, when about discouraged with sickness and other calamities, mother's bright hopefulness was worth more to them than the doctor and his medicine. Her help was not words only. While she explained to them that things might be worse, and how they could go to work to make them better, she took off her things and went to work with hands, feet and brain—yes, and with a loving heart.

When I was between 30 and 40 years of age I ran across a part of a text that somebody had painted on the fence—"Love ye your enemies," etc. It seemed to me a pretty hard task—too great for average humanity. I talked with mother about it, and I told her that I honestly believed that that text came from heaven—that it was above earth and earthly things. I was an unbeliever at that time; but I knew and recognized that it was not a hard task for her to love her enemies and "do good" to those who hated her. Why, come to think about it, there was not anybody who "hated" her. In her whole life of 90 years, I can not recall a single person who hated my mother. There are quite a number, perhaps, who hate A. I. Root; and from what I know of the chap I can not say that I blame them very much. Perhaps if mother had tried to run a big factory and publish a bee journal, it might have been different; but God did not call her to do that work. He called her to bring up the seven children so that they would be better fitted for work of this kind; and she did her part well. No matter what the result has been, she certainly did her part in the work. I think I can say truthfully that whatever there has been good and helpful about the "Home Papers" that have been going on now for 48 years is due largely to the teachings and instructions I received from my mother. She demonstrated and proved, right before my very eyes, the truthfulness of Scripture texts. If I had not caught on to some of her grand precepts, I should have been dull and stupid; and may God be praised that, through the dear Savior's help, I have been instrumental in pointing the world to the unexplored regions that are to be found in weaving these grand truths into our everyday lives. I told you she did not rejoice in iniquity; but, oh, how she did rejoice in the truth! When her mind began to fail, and she lost interest in the affairs of life, if one were to commence to tell her that somebody she knew had just united with the church, her whole sympathies would be aroused. She would wake up, as it were, and inquire for further particulars, and thank God that one more had been ushered into the Kingdom.

My mother was hopeful. She was always looking for sunshine, and she always found it. It was fortunate in many respects that she was so, for father was given to spells of depression. And when he had these "blues," her mission seemed to be to brighten him up. Now, do not understand me that mother was all right and father all wrong. It is a good thing to have the blues sometimes. It is a good thing for the seven children that we had a father as well as a mother. Mother alone would have been inclined to let some of the young Roots get pretty wild. I was a stiff-necked youngster, often needing punishment; but mother would have been so sure that I did not mean to be bad that she would not have punished me. Father believed in having everything straight and square. He could not tolerate crookedness in a deal any more than mother could tolerate sham; and when he found a man who was crooked

he was always ready to put him in jail or publish him in the papers and let everybody know about it. With mother to hold him back they two made a pretty good team, not only in the family but in the neighborhood.

Once a stone mason owed father some money, and he would not pay it. Father got hold of the mason's tools, and told him he could not have them until he paid the debt. Mother said it was too bad for the poor man to lose a day's work because he could not get his tools; and she told father before he went away to his work that she would give the mason his tools if he came after them. Father hid them and told her, as he went away, she might do so if she could find them. She found them buried in some barrels of wheat, and the mason went off to his work rejoicing. Sometimes it was a question as to which of the two was right—justice or mercy, as we might say. But both together they made a very useful couple in the affairs of life, even in those early days. In later years father had trouble about a line fence. After his death it transpired that he was right and his neighbors wrong. He dwelt on his wrongs so much about the line fence that he wanted to withdraw from the church. I remember hearing him tell the pastor of the church that he would have withdrawn if it had not been for his wife. The pastor replied something like this:

"Dear brother Root, I am well aware that your good wife has pulled you through many troubles, and has succeeded pretty well in keeping you from breaking away, from getting out of the straight and narrow path; and through God's providence I expect that your good wife will eventually pull you through the pearly gates; and then her work, so far as you are concerned, will be done. Now be patient and follow her guidance, and do not let the enemy prevail against her."

The above are not the exact words, perhaps, but the substance of what was said, and it was her privilege to see him breathe his last, at peace with all the world and with God.

Lest I give you the impression that mother was always and under all circumstances of the non-resisting class I think I shall have to mention that, a few times in her life, she showed a spirit of war—that is, if that is what it should be called. Once she had something to do with a woman who was coolly and deliberately bad. Mother came out squarely for war. She showed a spirit no one ever suspected in her usually mild make-up; and in conversation with me afterward I was almost startled to hear her say that she sometimes thought that, where a woman of this kind had given herself wholly to Satan, the best thing that could be done with such women was to burn them up. You will remember that there are places in the Bible which seem to teach that, in case there is no hope of the conversion of guilty parties, the welfare of humanity sometimes demands that God bring about a swift and certain destruction.

Now, dear friends, lest I give you the impression that these peculiar traits I have mentioned were the result of birth, or of being "built that way," to use a common expression, let me tell you that she gave her childish heart into the Savior's keeping when she was but 11 years old. Her mother was a devoted Christian; but I am sorry to say that her father was not a believer. He gave her no help in her Christian life; in fact, it was the other way. True, he was an upright, honest man; in fact, he often prided himself on being more fair in deal and more upright in life than some of the professing Christians about him. During those early years when books and papers were not so plentiful as now, her Bible was her almost constant companion. I have heard her tell about going into the fields with her Testament and reading its precious passages by moonlight. Truly her "delight" was "in the law of the Lord."

When she was about 16 years old she began to be beset with doubts, and she began to fear that she was not a Christian; and I have heard her tell many a time how earnestly she prayed over the matter, and asked God to give her plain evidence that would dispel all doubts along that line. That evidence was given; and all through her life she looked at it as something bordering on the miraculous. At any rate, it was so plain and clear that she never afterward doubted for one instant. Her faith never wavered.

The time I came so near dying that a council of doctors said there was no hope, my mother kept on praying; and when she pulled me through after a flickering life of many weeks, she declared I was a child of promise and she held fast to the idea, even during the period of partial skepticism during my early manhood. One day, when I was studying "Langstroth on the Hive and the Honeybee," I distinctly remember her saying that the time would come when I would study God's word with just as much interest and delight as I was then studying bees. Although I laughed at her unswerving faith she answered that it would certainly come. She did not know how soon, but she said something to the effect that, when God saved my life in answer to her prayers, she was conscious of being given some promise or assurance that I

(Continued on page 760.)

Classified Advertisements

Notices will be inserted in these classified columns for 50c per line, 8 words to the line. Advertisements intended for this department can not be less than two lines, and you must say you want your advertisement in the classified columns or we will not be responsible for errors. For special conditions on bee and queen advertising please write us. Copy should be received by 15th of preceding month to insure insertion. Cash with copy, if credit has not been established previously.

REGULAR ADVERTISERS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Hugh G. Gregg, Noah Bordner, Edw. A. Winkler, Clarence Foote, Geo. H. Stout, Mrs. Alice Burrows, F. L. Barber, Walter Rink, Adam Bodenschatz, L. W. Mundhenke, George Jaquays, G. A. Gust, E. L. Lane, F. W. Summerfield, L. S. Griggs, E. A. Reddout, C. J. Freeman, Albert G. Hann, Virgil Weaver, A. I. Root Co. of Chicago, Earl Rulison, H. R. Fisher, J. C. Abbott, Howe Food Products Co., Superior Honey Producers' Exchange, Chas. Reynders, Thos. D. Sherfick, Joe Milinaritz, A. W. Smith, W. W. Talley, J. F. Rogers, Hickory Shade Apiary Co., Rule Bros., Robert B. Spicer, Citronelle Apiaries, J. B. Hollopeter, C. I. Goodrich, D. T. Gaster, Peter Schaffhauser, R. B. Grout, Sam Hinshaw, Charles Kennard, The Marugg Co., E. D. Townsend, J. A. Crane, Frank Murray, Seward Van Auken, W. S. Wiggins, M. H. Hunt & Son.

HONEY AND WAX FOR SALE.

FOR SALE—White clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Comb honey at lower prices. Write H. G. Quirin, Bellevue, Ohio.

CLOVER-BASSWOOD honey in new 60-lb. cans. Sample 20c. W. B. Crane, McComb, O.

HONEY, fine quality; clover and buckwheat in 60-lb. cans. H. F. Williams, Romulus, N. Y.

FOR SALE—White clover honey in new cans, 11c per lb. Hoehn & Honigford, Ottoville, Ohio.

CHOICE white clover extracted honey in new 60-lb. cans. Prices on request. W. X. Johnston, Port Hope, Mich.

FOR SALE—Very fine quality of raspberry milkweed honey in new 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—Comb and extracted white clover honey. Prices on request. Dr. E. Kohn & Son, Grover Hill, Ohio.

FOR SALE—Finest new white clover honey in new 60-lb. cans and 5-lb. pails. Sample 15c. A. S. Tedman, Weston, Mich.

FOR SALE—A very fine quality of extracted clover honey in new cans. One case or a carload. J. N. Harris, St. Louis, Mich.

FOR SALE—Finest white honey from the clover fields of Missaukee County. Per case (120 lbs.), $14.50; discount on larger lots. J. H. Corwin, Merritt, Mich.

FOR SALE—Comb honey at lower prices. Write H. G. Quirin, Bellevue, Ohio.

10,000 lbs. Michigan clover honey in 60-lb. cans and 5-lb. pails. Sample free. Frank Rasmussen, Greenville, Mich.

FOR SALE—A fine grade of well-ripened white clover honey in 60-lb. NEW cans. E. E. Hutchins, Massena, N. Y.

FOR SALE—Finest quality clover honey in 60-lb. cans and 5-lb. pails. Sample, 15c. Arthur Thayer, Freeland, Mich.

FOR SALE—Buckwheat honey in kegs and 60-lb. cans, 2 to case, 10c lb. Sample, 15c. Henry Lansing, R. F. D. 3, Troy, N. Y.

FOR SALE—New crop white clover honey, new cans for $14.40 per case of two 60-lb. cans, liquefied. J. J. Lewis, Lyons, N. Y.

COMB honey all sold. Extracted buckwheat honey in 5-lb. pails at 75c per pail. Chas. B. Hatton, Andover, R. F. D. No. 3, Ohio.

FOR SALE—New crop light-amber extracted honey in new 60-lb. cans. Sample and price on request. Meyer Toom, Knoxville, Iowa.

FINEST QUALITY—Light amber honey in new 60-lb. cans, two cans in case, $14.00. Sample by mail, 15c. E. G. Kyte, Emporium, Penn.

FANCY clover extracted honey, new crop, in new 60-lb. cans. If you want the best write for prices. Sample, 20c. D. R. Townsend, Northstar, Mich.

FOR SALE—New crop extracted honey, two 60-lb. cans in a case, white clover, $14.50; light amber, $13.00; amber, $12.00. J. G. Burtis, Marietta, N. Y.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gal. barrels. Samples and prices on request. A. I. Root Co., 23 Leonard St., New York City.

HONEY FOR SALE—In 60-lb. tins; water white orange, 15c; white clover, 13c; for immediate shipment from New York. Hoffman & Hauck, Woodhaven, N. Y.

DELICIOUS clover honey in 5 and 10 lb. pails and 60 lb. cans. Write for price in one pail or ton lots. Earl F. Townsend, 109 Oak St., Wyandotte, Mich.

HONEY FOR SALE—In 60-lb. cans. Dandelion and clover. Clover and basswood. Quality unexcelled. State quantity wanted. Edw. Hassinger, Jr., Greenville, Wis.

FOR SALE—White comb honey in 4 x 5 sections. Clover and clover-basswood and buckwheat and fall honey in 60-lb. cans, 2 to case. G. M. Brewer, Medina, N. Y.

FOR SALE—A few cases of choice clover extracted honey, new cans and cases. State quantity desired. Also a few cans clover honey which has gone through capping-melter. Good color. J. D. Beals, Oto, Iowa.

FOR SALE—Choice extracted honey. White clover, basswood and sweet clover, very light and good. 60-lb. can, $9.00; two, $16.80; 5 case lots, 12c per lb.; 5-lb. pails, 6 for $5.00; $40.00 for 50. Sample, 15c. W. A. Jenkins, 10 Bluff St., Hamburg, Iowa.

FOR SALE—New crop of 50,000 lbs. of choice white clover extracted honey in new 60-lb. cans and cases, $15.60 per case, 10 cases or more, $15.00 per case; 5-lb. pails, $10.20 per doz., or $80 per 100. Sample, 15c. O. H. Schmidt, Bay City, R. F. D. No. 5, Mich.

RASPBERRY HONEY for sale. Left on the hives until thoroughly ripened by the bees. It is thick, heavy body, rich and delicious. Put up in 60-lb. cans, two cans to case for $15.00, and one for $8.00. Sample by mail for 20c, which may be applied on purchase. Elmer Hutchinson & Son, Lake City, Mich.

FOR SALE—Fine quality, alsike, sweet clover blend in 60-lb. cans and 5-lb. buckets at 12c and 15c per lb. Clifton Weaver, Van Wert, Ohio.

HONEY BY PARCEL POST—Finest quality. ½ gal., $1.35; 1 gal., $2.50, postpaid to third zone. For larger quantities, write Elmer Porter, Roxabell, Ohio.

FOR SALE—Fancy Northern Michigan raspberry blend honey, 5-lb. pails, $7.80 per doz.; 10-lb., $15.00 per doz. Sample, 20c. Lewis A. McIntire, Boyne City, Mich.

FOR SALE—New white clover extracted honey, 60-lb. cans, 12½c a lb.; 12 5-lb. pails, $10.00; 6 10-lb. pails, $9.00. Sample by mail, 15c. J. M. Gingerich, Kalona, Iowa.

FOR SALE—Michigan white extracted honey in 60-lb. cans. Sample, 15c. State quantity wanted. Attractive rates for the larger orders. M. H. Hunt & Son, 510 N. Cedar St., Lansing, Mich.

FOR SALE—Extra-fine quality light-amber extracted honey in new 60-lb. cans, 10c per lb., 10 cases or more, 9½c. This honey is almost all white clover with a small tint of dandelion. Martin Carsmoe, Ruthven, Iowa.

HONEY AND WAX WANTED.

WANTED—Comb honey, extracted honey and beeswax. C. J. Morrison, South Bend, Ind.

WANTED—White clover or basswood extracted honey. Send sample. Roscoe F. Wixson, Dundee, N. Y.

WANTED—For resale, white clover comb, carload or less. E. W. Peirce, 709 Shelby St., Zanesville, Ohio.

WANTED—Comb honey. Shipping cases returned free. Quote your best cash price delivered at Preston. M. V. Facey Honey Co., Preston, Minn.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade price, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, Ohio.

OLD COMBS, cappings or slumgum wanted for rendering by steam press process. We pay cash for wax rendered, trade for supplies or work it into foundation .W. T. Falconer Mfg. Co., Falconer, N. Y.

OLD COMBS WANTED—Our steam wax presses will get every ounce of beeswax out of old combs, cappings or slumgum. Send for our terms and our 1923 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Ill.

FOR SALE.

HUBAM clover seed, 1923 crop Wisconsin-grown. Write for prices. A. C. Baumgarten, Thiensville, Wis.

FOR SALE—Soiled cane sugar for feeding bees. Winkler Honey Co., R. F. D. No. 1, Joliet, Ill.

TYPEWRITERS, $20 up. Easy payments. Trial allowed. Payne Co., Rosedale Sta., K. C., Kansas.

ROOT Quality Bee Supplies. Airco Foundation and Honey Containers. F. A. Martiny, New Orleans, La.

ROOT bee supplies and AIRCO foundation for 1923. A. V. Small, successor to C. F. Buck, Augusta, Kans.

CONNECTICUT and Rhode Island headquarters for Root's beekeepers' supplies. A. W. Yates, Hartford, Conn.

FOR SALE—Two Hatch wax presses, regular price, $15.00, our price, $10.00 each. The Stover Apiaries, Mayhew, Miss.

FOR SALE—Apiary and other paying interest in bees. Outfit and business, $1000. B. F. Averill, Howardsville, Va.

FOR SALE—400 Hoffman standard frames knocked down, and 200 nailed together. E. Herivel, 5749 30th St., Detroit, Mich.

SEND TODAY for samples of latest honey labels. Liberty Pub. Co., Sta. D., Box No. 4003, Cleveland, Ohio.

FOR SALE—We offer only good second-hand 60-lb. cans, two in a case, at $6.50 per 10 cases, or $15.00 per 25 cases. A. I. Root Co., 224 W. Huron St., Chicago, Ill.

FOR SALE—Good second-hand 60-lb. cans, two cans to case boxed, at 60c per case, f. o. b. Cincinnati. Terms cash. C. H. W. Weber & Co., Cincinnati, Ohio.

CASTONE containers are a 24-oz. glass package that retails readily at 50c. Prepare for the pancake season. Sample by mail, 16c. G. H. Price, Newark, N. Y.

ATTRACTIVE LOW PRICES—Write us for list of odds and ends, shipping cases, hives, etc., first grade, priced to save you money. Dadant & Sons, Hamilton, Ill.

ROBINSON'S comb foundation will please the bees and the price will please the beekeeper. Wax worked at lowest rates. E. S. Robinson, Mayville, Chau. Co., N. Y.

FOR SALE—Get our special prices on tin, glass and paper honey packages. Shipments from Detroit, Chicago or Grand Rapids. A. G. Woodman Co., Grand Rapids, Mich.

HONEY-NUT CHOCOLATES. A new and delicious confection made of pure honey, nuts, fruits, etc. $1.00 lb., 50c ½ lb., postpaid. Wholesale prices on application. J. D. Kroha, 87 North St., Danbury, Conn.

SIX-ROOM house, two finished, city water, 5 acres irrigated, 3 miles from city, 15 stands of bees with supplies in alfalfa country. Health failing. Price $3500. O. I. Lewis, Box 231, E. Las Vegas, N. M.

HON-E-NUT CHOCOLATES. Reg. trademark since 1917. The original honey, nuts and fruit confection. $1.00 per pound, postpaid. A chocolate beehive, full of honey and nuts, 2 for 25c or $1.10 per dozen postpaid. Fairmount Apiaries, Schuylkill Haven, Penn.

SPECIAL PRICES—We are offering at specially low prices some very high-grade material in shipping cases, frames, hives and miscellaneous which represent items we no longer carry regularly in stock or which have to be closed out to make room for new stock specially equipped to take Dadant's Wired Foundation. If interested, write for list; we can save you money. Dadant & Sons, Hamilton, Ill.

FOR SALE, BARGAIN—Well-established queen and package business, and 100 to 500 two-story colonies, 8 and 10 frame hives, abundant stores. Fine mailing list of satisfied customers. A good local honey trade. This is something with a future to it. Other disposition will be made of bees not desired by party taking over our interests. Price right for cash. Reason for selling: Other interests and an affliction of the nose which will not permit my constant attention and use of smoker. If desired, 56 acres of land for home, partly improved, one mile from good town with graded high school. On Government Aid Rock Highway. Healthy climate, good water. Terms. Jensen's Apiaries, N. C. Jensen, Prop., Crawford, Miss.

GREATEST bargain ever offered on new 10-frame supers, reversible bottoms and covers nailed and painted; also loose-hanging frames. Write for prices. Henry Eggers, Birchwood, Wisconsin.

WANTS AND EXCHANGES.

WANTED—To buy about 150 colonies with winter cases and complete equipment for extracted honey production. Must be free from foul brood and reasonable in price. Will move the outfit to our own location in northwestern Illinois. Hawthorne Farm Co., Barrington, Ill.

BEES AND QUEENS.

HARDY Italian queens, $1.00 each. W. G. Lauver, Middletown, Pa.

BRIGHT ITALIAN QUEENS, 75c each, by return mail. P. B. Skinner, Greenville, Ala.

SEE our advertisement for PACKAGE BEES on page 760. Loveitt Honey Co., Phoenix, Ariz.

"SHE-SUITS-ME" queens for rest of season, $1.00 each. Allen Latham, Norwichtown, Conn.

BRIGHT Italian queens, $1.00 each; $11.00 per doz. Send us your orders. Graydon Bros., R. F. D. No. 4, Greenville, Ala.

PURE Italian and Carniolan queens, the best of either race, $1.00 each. J. E. Wing, 155 Schiele Ave., San Jose, Calif.

PACKAGE BEES for 1924, 2 lbs. with select queen, $4.25; 5 or more pkgs., $4.00 each. Everything guaranteed. J. J. Scott, Crowville, La.

ITALIAN queens, three-banded, also Golden untested, $1.00 each; tested, $1.50 each. Satisfaction guaranteed. P. O. Watkins, Cullasaja, N. C.

GOLDEN ITALIAN queens, producing large beautiful bees, solid yellow to tip. Package bees, nuclei circular, 1924, ready free. Dr. White Bee Co., Sandia, Texas.

BOOKING orders for 1924. Two-pound package, three-banded Italian bees, with select breeding queen, $4.25. No disease. Guaranteed satisfaction. J. Allen, Catherine, Alabama.

BEES BY THE POUND—Also QUEENS. Booking orders now. FREE circulars, giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

PACKAGE BEES, NUCLEI and QUEENS. Pure bright three-band Italians, April and May delivery. Free from disease. Get my prices and circular before ordering. Guarantee safe arrival. J. L. Morgan, Apalachicola, Fla.

HIGH-PRODUCING, THREE-BAND BEES AND QUEENS. Now booking orders for 1924 delivery. No disease; safe arrival and satisfaction guaranteed. Write for circular and price list. J. M. Cutts, Route 1, Montgomery, Ala.

FOR SALE—200 colonies of Italian bees in 10-frame hives, $4.90 each, if you take all and load the bees yourself. All colonies guaranteed free from disease. If you come and look at them you will buy them, because they are in good shape. J. L. Fajen, Stover, Mo.

PACKAGE BEES FOR 1924—Yancey hustlers; they get the honey. Three-band strain only. Now booking orders for spring delivery. Place your order early and make sure of shipping date; 10 per cent will book your order. We do not book more orders than we can fill promptly. Safe arrival and satisfaction guaranteed on every package and queen shipped. Caney Valley Apiaries, Yancey Bros., owners, Bay City, Texas.

LATE QUEENS—I can mail queens any month of the year. Tested queens only after November 1 at $1.00 each, for the months of November, December, January and February. Let me have your order. I have the queens now ready. D. W. Howell, Shellman, Ga.

FOR SALE—About 85 swarms with extractor, extra hive bodies, comb and extracting supers, in a favored section, with a big future at door. Best markets 15 miles, roadside comb 35c to 50c. Minimum wintering troubles. A give-away at $1200. F. N. Hagmann, Jr., Vienna, Va.

300 COLONIES IN SOUTH.—With or without 60-acre farm. Will sell or exchange both for Detroit city property only. 300 colonies with good equipment, including saw outfit and new 3-H. P. engine, extra hives, etc., in best queen-rearing and package section of South. Good business and reputation established. No disease. Everything ideal, just like you would want it. Am physically unable to attend. Terms to right man. Or, will let on shares to reputable and competent man who can furnish light truck and finance himself. Address A. J. Heard, Bonaire, Georgia.

MISCELLANEOUS.

THE BEE WORLD—The leading bee journal in Britain and the only international bee-review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. The Apis Club, Benson, Oxon, England. Send us a postcard today. It is well worth your little trouble.

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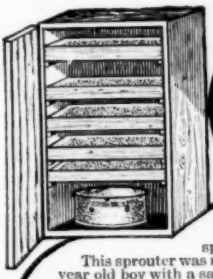
(Continued from page 728.)

is possible at the time of the honey flow, that the colonies were not up to their maximum strength before the honey flow. From this it follows that nectar is being lost during the beginning of the honey flow for lack of bees to gather it. It has been found by the better beekeepers of the United States that, if the bees are provided with abundant supplies of honey in the spring, if they have abundant room for the rearing of brood and if they are well protected from cold, the colony may be brought to the peak of population before the time of the secretion of the main honey flow. To have colonies in this condition in time for the maximum gathering of nectar requires the highest skill in beekeeping, and it is greatly to be doubted whether the beekeepers of any country have as a whole arrived at this state of advancement. Certainly the beekeepers of America have not, for even in the orange region of California where apiaries are closely packed, many colonies are so weak at the beginning of the orange honey flow that probably half the nectar is lost.

To discuss the improvement of the flora, while the beekeepers are wasting at least half of what is available, seems from the standpoint of the American beekeeper to be a waste of effort. American beekeepers will have no objection to a careful study of the nectar-secreting ability of the various species of plants, nor to trials of nectar sources by planting. They are eager for just such studies and will welcome the results. They feel, however, that the beekeeper who makes this effort might, from the standpoint of practical beekeeping, be better occupied by trying to get his colonies strong enough to get the vast floods of nectar that Nature is pouring forth in all parts of the world ready for the use of the bees if they were but at hand.

Washington, D. C.



Oat Sprouter $2.99

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(Continued from page 755.)

would in some way teach "Christ and him crucified." Poor mother! she watched and waited a good many years before her prayers were answered.

Mother's faith and example continue to make themselves felt, not only through her children, but also through her children's children. I think we can truthfully say of her, "Blessed are the dead who die in the Lord from henceforth; yea, saith the Spirit, that they may rest from their labors, and their works do follow them."

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With honey nice and thick.

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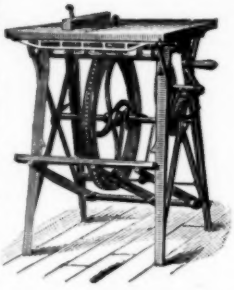

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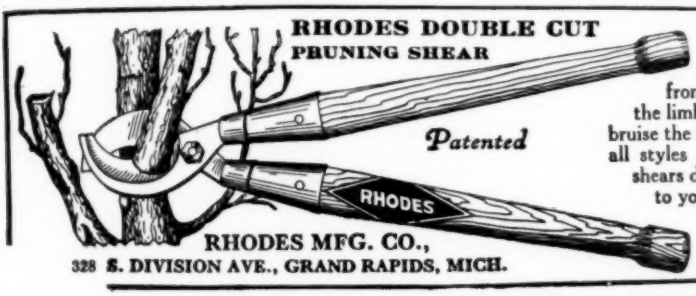

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We do not claim to have bees with tongues a foot long or to be as gentle as flies; and we do not name each of our Queens or send a pedigree with each bee; or to send a pound extra. But if you will buy ten three-frame nuclei from us and give them exactly the same hives, combs, etc., and on the same date in the same yard, and they do not make as much honey as the other man's—we do not care whose—we will refund the purchase price. We are in a territory absolutely free from brood disease. We will furnish a health certificate with each shipment. Reference, First National Bank of Moultrie, Ga. Write for prices.

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on lumber still determine the prices you pay for Muth's Beekeeper's Supplies. But----

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We render WAX from your old COMBS.

Association Secretaries, Write for our proposition on supplies.

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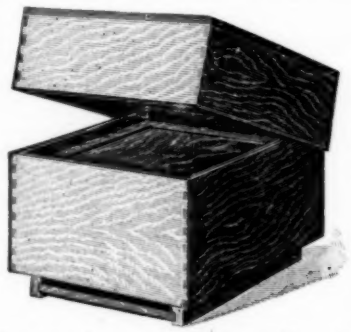

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At Very Low Prices

The time is here when your bees may have to have some added protection if they are to live through the winter. In many localities the metal-top winter cases, which we here offer you, with loose packing, will afford the much needed protection to bring your bees through the winter safely. Since we are no longer listing them in our catalog, we will close out our stock at greatly reduced prices.

We offer out of our New York warehouse:

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